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# ATLAS

OF THE

# WORLD'S COMMERCE

A NEW SERIES OF MAPS WITH DESCRIPTIVE TEXT AND DIAGRAMS

SHOWING

**PRODUCTS, IMPORTS, EXPORTS**

COMMERCIAL CONDITIONS AND ECONOMIC STATISTICS

OF THE COUNTRIES OF THE WORLD



COMPILED FROM THE LATEST OFFICIAL RETURNS AT
THE EDINBURGH GEOGRAPHICAL INSTITUTE

AND EDITED BY

J. G. BARTHOLOMEW, F.R.S.E., F.R.G.S., Etc.

*Victoria Gold Medallist of the Royal Geographical Society*











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TO THE RIGHT HONOURABLE

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## *EDITOR'S NOTE*
## *ON THE PREPARATION OF THE ATLAS*

*In the compilation and preparation of the statistics and descriptive text, I would particularly acknowledge the painstaking research of Mr. W. A. Taylor, who has been engaged on the work for over two years. In the compilation, drawing, and production of the maps, I would acknowledge the assistance of the following members of my staff, who have specially contributed to the execution of the work in their various departments.*

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*February*, 1907.

# PREFACE

T no period in the world's history has there been commercial expansion of such stupendous growth as at the beginning of this twentieth century. Every year new lands are being exploited and new regions opened to commerce. Everywhere the old is giving place to the new, the barriers of the ancient civilisations are breaking down; the centres of trade are changing and will continue to change as long as this great development advances. Such an expansion means not only penetration into new lands, but the growth of an intellectual conception of the world as a whole, involving the expansion of our economic, political and social horizons. Commerce leads the way, and in this new age it has come to be realised that commerce is the real basis of our modern material civilisation, and that the nations which maintain commercial supremacy will also be assured of political supremacy.

National competition for the world's trade must every year become keener, and in such competition a thorough appreciation of the whole economic situation will be of primary importance. At the outset there must be a knowledge of the material resources of the countries of the world and the geographical conditions of their development, transport and distribution. From the merchant's point of view the world may be regarded as a vast commercial exchange. For the supply of certain articles of produce we are dependent on certain countries. Every country imports to some extent from every other country, and no country is altogether commercially independent. Further, when we come to consider whether a country may more profitably develop its resources and industries by imposing protective tariffs or whether it may derive more benefit by free imports, we arrive at the burning problem commonly known as the "Fiscal Question." The key to all these problems lies in a proper apprehension of the facts and principles of economic geography, and to master these facts and principles nothing is more invaluable than a graphic summary of them, such as can only be effectively conveyed to the mind by maps and diagrams.

These considerations have led to the production of the present Atlas. The first object of the Atlas is to show where all the commodities of commerce come from—our food, drink, clothing, and all that we use in our daily lives. Perhaps few people realise that the food to supply our simplest meals has come from far distant lands, and that its provision necessitates an elaborate organisation of industry, capital, transport, and distribution. All this is shown in the Atlas. It is a key to the merchandise of the world—a summary of its material resources. Its numerous maps, diagrams, and text show the distribution of the various products, the imports and exports of the various countries, also their natural resources—developed and undeveloped, the means of communication and transport, and many other aspects of international commerce. It is the first Commercial Atlas on a large scale that has been published in this country. Its preparation has occupied several years, and represents much labour and research. It embodies the substance of many hundreds of Blue Books, Trade Returns, and Commercial Reports from all countries of the world. It aims at presenting a graphic statement of the world's commerce of to-day, and, although not specially designed to illustrate the "Fiscal Question," will throw much light on the solution of this great problem of international trade now before our statesmen.

In a pioneer work of this nature we are well aware that there must be many shortcomings and defects, and we can only plead that these are practically unavoidable under the existing difficulties to be encountered. Such a work, instead of being left to private enterprise, should properly have been undertaken by an International Bureau of Geography and Statistics or by some Government Department, such as the Board of Trade. Under the auspices of such an organisation, with reasonable expenditure, it might well have approached perfection. In fact, in the case of the United States such an ideal has to some extent been realised in the most admirable commercial statistics published by the Census Department, but they are confined to the United States. In an international work the difficulties are much greater. Any one who has made a study of international trade returns soon comes to realise how hopelessly irreconcilable many of these returns are, how the compilers appear to print whatever statistics come most readily to hand, altogether undigested and practically unedited, shutting their eyes to inconsistencies and shirking all difficulties. Reliable comparison of such returns is impossible, as they are grouped according to different methods, and would almost appear to be designed to defy rather than to facilitate comparison. Finally, while acknowledging the inevitable defects of our work, we would claim that, until a really adequate official atlas of the world's commerce is produced, the present work is the only serious attempt to supply a great want in our political and commercial education, and on this plea we would beg for it the kindly indulgence of students of economic geography.

J. G. BARTHOLOMEW.

*February*, 1907.


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# AN INTRODUCTION TO ECONOMIC GEOGRAPHY

By GEORGE G. CHISHOLM, M.A., B.Sc.

Author of *Handbook of Commercial Geography*.*

**SCOPE OF ECONOMIC GEOGRAPHY.**—The study of economic geography is so complex that it is of peculiar importance to have at the outset a clear idea of the nature of that study. This involves, first, the consideration of what is meant by the study of geography. With regard to certain functions of geography there never has been any dispute. It is universally recognised that it is the function of geography to observe the distribution of phenomena on the earth, equally so that it is the business of the geographer to record that distribution on globes and maps and otherwise, in such a manner that the facts may be easily grasped and studied. But it is as to the nature and aim of this study that there is still a good deal of misapprehension, leading to the inclusion in geographical treatises of much that should be omitted, to false estimates of the relative importance of facts that are rightly included, and the omission of much that ought to be taken into account.

If the entire study of the distribution of phenomena on the surface of the earth be taken as the field of the geographer, then no definition of the subject can be given which does not make it too vast for the powers of any individual. For example, if geography be taken to include the explanation of the distribution of land-forms, that is seen to involve the study of the history of the earth's crust, the field which has long been justly claimed by geology. It is reasonable, indeed, to regard geology as a daughter of geography, but if so, it must at the same time be recognised that the daughter has long been able to maintain a large separate establishment. Care must, however, be taken to see that that fact does not cause our conception of the relationship between the two to be reversed.

An important clue to the marking off of the field of geography may be found in what has from the first been the practice of geographers in observing and recording the distribution of phenomena. It will be found that the phenomena recorded are, for the most part, such as it is most important to consider with reference to the life of man. In an atlas such as Stieler's *Handatlas* some scores of signs are employed to set down phenomena of different kinds, and all of these are signs of what is of practical importance in influencing human life. If this clue to the nature of the subject be followed, then geography may be defined as the study of the influence on man of local conditions and place relations. Geography is thus a branch of study whose field is closely akin to those of the historian and the economist. The business of the geographer may be said to be to bring into relief the influence of local conditions and place relations on history and economic development.

Now, if this view of geography be taken, two consequences are fairly obvious.

First, geography, like most other branches of study, must take into account a great many facts which are derived from other studies. That heat causes the evaporation of water, or that cold promotes the condensation of water-vapour, that moisture is necessary to vegetation, and that some kind of vegetable life is necessary to man are not geographical facts, but they make it important for geographers to ascertain where the evaporation of water takes place most rapidly, and where water-vapour is recondensed under such circumstances as favour those forms of vegetable life which are of most importance to man. It is not a geographical fact that wheat is one of those forms of vegetable life, or that the growth of wheat is favoured by certain conditions of soil and climate; but it is a most important geographical fact that those conditions are present in certain parts of the earth and not in others. It is not a geographical fact that rocks of a certain geological age or formation generally give rise to certain types of land-forms, or are likely to contain certain minerals of economic importance, or to yield by decomposition soils of such or such a character; but it may be important on these grounds for the geographer to note where such rocks are found. It is not a geographical fact that friction is an impediment to transport, that gravity is apt to be a similar impediment, or that railways are the most effective means of reducing such impediments to a minimum on land; but, these facts being recognised, it becomes important to note where, if goods have to be transported in spite of such impediments, there are the greatest facilities for the laying of railways. It is not a geographical fact that there is much less friction involved in water transport than in any mode of transport by land, but this fact makes it important to note where water carriage is available. It is not a geographical fact that various costs are necessitated by a change in the mode of carriage; but this being so, it becomes important to note where those costs can be avoided or reduced by the construction of bridges and tunnels, the establishment of ferries, the utilisation and improvement of natural, and the construction of artificial harbours. It is not a geographical fact that energy may be derived from moving air or water, from solar heat, from fuel and explosives; but it is important to note in geography where all these sources of energy are most easily available. It is not a geographical fact that iron is a useful metal; but as it is extremely useful, it is very important to know where its ores are to be found to most advantage. It is not a geographical fact that there is generally greater industry where security is provided for the fruits of industry; but, as this is unquestioned, it becomes important to observe where, and to what degree, that security is provided.

In short, any influence is to be regarded as geographical which has a local attachment, the term local being used in the widest sense, as applicable, on the one hand, to a continent or an ocean; or, on the other hand, to some particular spot, where, for instance, there may be a valuable water-power, or a deposit of ores of exceptional richness, or presenting peculiar facilities for working. Amongst such influences it is the business of the geographer to select the most important and to indicate the degree of their importance. Where geography is studied in any particular aspect, that importance will be determined in a large measure by the special subject of study, and therefore we must now inquire into what is involved in the qualifying term "economic," which describes the branch of geography which is our present subject of consideration.

In economic geography, what we have to consider is the influence of local conditions and place relations on the production of commodities, and the bringing of those commodities into the hands of those who make use of them. The subject therefore embraces all geographical conditions affecting the production, transport, and exchange of commodities.

* Longmans, Green & Co., 5th edition, 1904, 15*s*. net.

But, secondly, geography must take into account the fact that these conditions are subject to change. We know that coal was mined in Britain in Roman times, but no one then could have any idea of what that product would mean for the economic geography of the country at the present day. The conditions affecting economic geography are now in fact subject to change at an increasingly rapid rate, and this makes it necessary to study the nature and causes of those changes. Some of those causes are such as bring about mere fluctuations, but others bring about a permanent change of conditions leading to a development which economic geography cannot disregard. From the earliest times of which there is any record, or with regard to which there is any evidence, there has been an increasing tendency to use to the full the possibilities of production on the surface of the earth so far as they were known and could be used by the existing population. But the development thereby promoted, while helped forward by some causes, has on the whole been very slow owing to various hindrances. On the whole, however, the progressive tendency predominates, and has given direction to the whole course of economic history and in a large measure to that of political history.

An adequate study of economic geography therefore embraces (1) an attempt to gauge the possibilities of production in different parts of the earth, including a consideration of the influence on such possibilities of the existing means of transport and opportunities for exchange, and (2) the various helps and hindrances that have resulted in the present stage of development and are affecting the course of that development at the present time.

As to the possibilities of production, it is obvious that these can be gauged only in the light of what is already known. Still it must be recognised that at all times there have been some fundamental facts of the highest importance in relation to economic geography. To discern what these are it will be well to make a brief analysis of what is included under the heads of production, transport, and exchange, and to observe how geographical considerations arise with reference to them.

**1. PRODUCTION.—Classification of Commodities as Products.**—From the point of view of production commodities may be divided into the following groups :—

(*a*) Products derived from wild animals and trees and other vegetable forms growing wild. This group includes most fishery products.
(*b*) The products of agriculture, and the rearing of live stock, from elephants to insects and oysters.
(*c*) Mineral products.
(*d*) Manufactured articles.
(*e*) Non-material products of labour, such as discovery and invention ; books, plays, and artistic products ; business organisation and management ; government and administration.

**Geographical Considerations with Reference to Products of Different Kinds.**—That geographical considerations must be taken into account in the first three of these groups, *a* to *c*, is too obvious to need even exemplification. With regard to mineral products, however, it may be pointed out that we have not merely to consider the fact that they can be extracted only where they happen to occur, but in some cases their very existence depends on, in other cases their working is more or less affected by, the character of the climate. In various parts of the world, for example, common salt, borax, nitrate of soda, and other soluble substances of commercial value are found on the surface of the ground where only a rainless climate would allow them to exist. Then, again, the lack of rain and consequent deficiency of water greatly hindered at one time the working of the Coolgardie goldfields, and has necessitated great expense in furnishing an adequate supply of water; and with regard to the Yukon goldfields an official report states that the gold output there "depends as completely upon the rainfall as the agricultural crops in other parts of Canada. It depends more now upon the rainfall than formerly, when water was used chiefly for supplying the sluice-boxes and enabling the separation of the gold from the pay-dirt therein [to be carried out]. Now much dirt is removed from place by hydraulic methods, and for this purpose more water is required."[1]

The mode and degree in which manufacturing industries are affected by geographical conditions can in many, if not in most, cases be appreciated only by those who have an intimate acquaintance with those industries; and accordingly the study of this question belongs rather to the investigation of the particular industries than to a general study of economic geography; but this general study must at least serve to bring the importance of such considerations in certain cases into such prominence as will insure their not being overlooked in special inquiries. That certain manufacturing industries, such as the cotton industry, are favoured by the character of the climate is now a familiar fact. In some cases the presence or the vicinity of the raw material is a fact of dominant importance, especially where the raw materials are of great bulk in proportion to the manufactured product, as in saw-milling and the extraction of raw sugar from cane or beet, or in proportion to the value of the article, as in the case of jute as compared with other textile fibres. In other cases the presence of adequate supplies of suitable labour is an important consideration, in other cases that of a large local market. In other cases the economy of production on a large scale causes an industry to be carried on in one or two of many places in a region where such production is possible, on which account it frequently happens that minerals which are partly reduced from their ores at the place where they occur, in order to effect an economy in transport, are afterwards sent to a distance to be refined.

Under the last head of production (*e*), non-material products of labour, geographical considerations may enter from different points of view. Thus discoveries of new sources of supply may not merely add to available resources, but may abolish or reduce the value of sources of supply already known elsewhere, as happened in the case of the Cornwall tin-mines through the discovery of the mines of the Malay Peninsula. The discovery of a new route may greatly affect the geographical importance of places on an older route, as happened most conspicuously in the case of the discovery of the seaway to India, which will be considered more fully later on. Inventions may lead to similar results. With regard to business organisation and management, government and administration, one may consider not merely the parts of the world where excellent results under these heads are actually to be seen, but also the geographical conditions which may have contributed to the development of the qualities by which that success is achieved.

**2. TRANSPORT.**—Under the head of the transport of commodities the importance of geographical considerations might perhaps in some respects be looked upon as too obvious to need enforcing, and yet this is the part of economic geography which is perhaps least adequately treated, and too frequently treated with reference to conditions which have to a large extent passed away. There is hardly as yet adequate recognition of the fact that a country or region is more generously treated by nature which has ample facilities for the

[1] Annual Report on the Yukon Territory for 1902-3, quoted in the Annual Report of the Department of the Interior, Dominion of Canada, for 1902-3, Part IV.

construction of railways than one that is merely well provided with navigable rivers, or of the enormous difference between the great majority of navigable rivers and those of first-rate importance. Much of the attention devoted to minor rivers might be given with more profit to railway windings and gradients, tunnels and bridges. The collecting, handling, and delivery of commodities may be regarded as included under the head of transport, and with reference to all that transport thus comprehends it is important to consider the geographical conditions that favour working on a large scale.

**3. EXCHANGE.**—Under this head what the geographer, as distinguished from the economist, has to consider consists in such matters as these, the mutual relations of places that have an excess and deficiency of the same commodity, and the geographical conditions favouring the filling of carriages and ships with goods in both directions on certain routes, or the nearest approach to such reciprocal transport. With reference to this point it is assumed that the geographer learns from the economist the importance of the advantages arising from such conditions.

**Fundamental importance in Economic, as in every other branch of Geography, of Physical Features and Climate.**—From this brief survey it will be apparent that under all heads and at all times the character of the physical features and the character of the climate are fundamental considerations, and hence in economic, as in every other branch of geography, they must get the first place.

**PHYSICAL FEATURES.**—The detailed study of the physical features of the globe must be taken up in connection with the regions into which it is convenient to divide the earth for geographical purposes. Here it is only in place to state the broadest facts, and to indicate the nature of those which have to be examined in detail.

**The Relations of Sea and Land. Relative advantages of Sea and Land Carriage.**—The relations of the land-masses and the great oceans are of the highest importance with reference both to climate and transport. The influence of these relations on climate will be considered later on under that head. The importance of these relations with regard to transport is due to the relative advantages of sea and land in the carriage of goods. The advantages of the ocean in this respect arise from four causes :—(1) In the water there is less resistance from friction than in any mode of land carriage where goods are conveyed at a moderate rate of speed. It has been estimated that a single horse-power will suffice to draw at the rate of three feet per second a load of about 3000 lbs. on a good level waggon road, one of 30,000 lbs. on a level railway, and one of 200,000 lbs. through water. (2) On the ocean it is possible to increase indefinitely the size of ships, and consequently the quantity of goods that may be conveyed at one time, at a relatively small increase of cost. (3) It is possible to travel in any direction through the ocean, whereas on land the most advantageous means of transport (steel railways) have to be specially provided for every route. And (4) at sea, wind power can be more extensively utilised for transport than on land, one of the facts giving peculiar importance to the geography of prevailing winds, which will be considered under climate. On the other hand, there are counterbalancing advantages on the side of land as compared with ocean carriage :—(1) On land it is less costly to develop a high rate of speed than through the water. This arises chiefly from the fact that in the water so much power is lost owing to the absence of a firm fulcrum so that the propeller passes through the water, but largely also from the fact that the friction in the water is so greatly increased and other resistances besides friction and air resistance are brought into play. On the other hand, it is more practicable to develop high speed at sea than on navigable rivers. On the smaller rivers high speeds are utterly impracticable, and even on the largest the greater care required in navigation prohibits the development of the highest possible speed. (2) At sea it is only on coasting voyages that intermediate points on the route may be served, whereas on land intermediate points may be served on many routes. (3) At sea there is much greater risk of loss from storms and other causes.

On the whole, however, there are enormous advantages in ocean transport, and this makes it a geographical fact of the highest importance that the ocean surrounds the land-masses of the globe.

**Facilities for Communication between the Coast and the Interior.**—This fact gives peculiar importance to the facilities for communication between the coast and the interior, for the great bulk of the commodities of the world are derived from the land, and of those which are obtained from the ocean all but a small fraction are consumed or made use of on the land. It is not in fact the mere relation of sea and land that is important, but the relation of the sea to populous areas or to highly productive areas, which may not be very populous, as in some of the mineral working districts of the globe. The facilities for communication with such areas are obviously greatly increased where there are points on the neighbouring coasts which naturally afford shelter for shipping, good natural harbours, and this fact in many cases gives importance among the physical features to the minute structure of the coast-line. Where there is on the one hand such a productive area, and on the other hand in the vicinity such a form of coast-line with no serious impediment in the way of communication between the two, a seaport is sure to grow up having the area in question for its hinderland—that is, the area that supplies that port with the bulk of its exports, and within which is distributed the bulk of its imports. But it should never be overlooked that for the existence of a seaport a hinderland is of more importance than a natural harbour. Many populous and productive seaboards are apt from their very nature to be poorly supplied with natural harbours, such as the alluvial strip on the east coast of the Indian peninsula and that of Upper Guinea, but nevertheless carry on a great deal of maritime commerce even without the aid of harbours of any kind; while, on the other hand, it may be said that natural harbours are most abundant where they are of little or no use, as on the coast of Labrador, the southern coast of Chile, the south-west of New Zealand, a large part of the coast of British Columbia, and of those of Norway and Dalmatia, and elsewhere.

**Broad View of the Physical Features of the Great Land-Masses.**—In the broad structure of the continents, the most important points to note are the differences in the distribution of mountains and high and low plains in the Old World and in Australia, as compared with corresponding latitudes of the New World. In the northern hemisphere it is to be noted that, in the Old World, the most important highlands, whether mountains or high plains, trend more or less from east to west, whereas in the New World the trend is from north to south. The most important exception to this rule is in the north of South America, where the general trend of the highlands is parallel to the coast. In the same hemisphere it is to be noted that in low latitudes the land is widely spread from east to west, whereas in America it is much contracted in that direction. It is likewise noteworthy that the continent of Africa, as a whole, is mainly composed of high plains bordered by narrow strips of lowlands on the coast, whereas, in South America, the continent that most largely corresponds with it in latitude, low plains in the interior are very extensive, one such area in equatorial regions having a very gentle slope from west to east, and opening to the Atlantic in the wide gap between the highlands of Guiana and those of Brazil, the other, in more southerly latitudes, with two gentle slopes, one from north to south and the other from west to east and touching the Atlantic on the inlets of La

Plata and Bahia Blanca, and other inlets farther to the south. In the latitudes in which South America, Africa, and Australia all correspond with one another, the most notable points of agreement and difference are these—that, while Australia and South Africa agree in having the highest elevations on the east side, and more particularly on the south-east, with a general trend parallel to the coast both on the east and south, the mountains on the seaboard side are succeeded in the interior of Australia by plains mostly under 1000 feet in height, those of South Africa are succeeded by plains of from 4000 to 7000 feet high, and that South America differs from both in having its highest elevations, the lofty and continuous chains of the Andes, on the west side, while the east sinks in the south to the low plains already referred to.

**Points for Special Consideration in a Detailed Study of Physical Features.**—In a more detailed study of physical features, apart from climate and vegetation, in economic geography, their relation to production and transport will determine the degree of importance to be attached to them. One will, for example, consider the extent of ground rendered unfit for cultivation by the steepness of slope, or the absence of soil, which often accompanies very steep slopes, and the facilities afforded for the construction of roads, railways, and canals. One will consider rivers and lakes as means of communication, and as hindering communication, and as yielding food-fishes; rivers as sources of water-supply for a variety of purposes, including irrigation and the development of mechanical power, and as means of drainage. Underground water circulation will also be considered with reference to the advantages to be derived from it.

**Rivers as Hindrances to Communication.**—With regard to rivers and lakes as assisting and hindering communication a few points are worthy of special attention. In the case of rivers it is important to note that while they may, in a greater or less degree, facilitate communication in the direction of their length, they must hinder communication from side to side. The tiniest rill flowing through a field forces one to an extra effort in making the step necessary to cross it. The innumerable bridges of a populous civilised country are a benefit due to our forefathers, the extent of which we are apt to forget. The hindrance to communication presented by the larger rivers has important geographical effects. At Dirschau, on the main stream of the delta of the Vistula, goods and passengers might sometimes be delayed for weeks waiting for the subsidence of floods or the disappearance of broken ice, till a bridge was built there in 1857, and similar delays might occur at Tilsit, on the Memel, down to the 'seventies of last century.[1] This consideration gives importance to such details of the physical features in river beds as afford facilities for crossing them, as, for instance, the existence of fords, or the presence of firm banks which may render the approach to the river easy and reduce the difficulties of bridging. Not infrequently the existence of an island, or islands, in the course of a river has caused the bridging to be done at such points, since it is easier to build two short bridges than one long one. The Ile de la Cité, at Paris, marks one of the oldest crossing-places of the Seine; the island in the Elbe at Magdeburg marked a crossing-place of that river as early as the time of Charlemagne (beginning of ninth century); the islands in the Oder at Breslau have helped to make that a focus of traffic between east and west for many centuries; the island of Kölln in the Spree at Berlin caused that part of the river to be singled out as a crossing-place on routes going from north to south.

**Rivers as Waterways.**—With reference to rivers as waterways, it is important to note the degree in which they facilitate communication. This depends in a very large measure on the character of the land-routes, and that again on the conditions of the time and the technical advancement in the region where the rivers lie. Some points, however, should always be remembered. Thus the capacity of a river for vessels of considerable size, and the rate of flow, are always matters of importance. So also is the comparative steadiness of its volume, and under this head it is important to note both variations incidental to the seasons, which are always dependent on the climate, but also the degree of liability to violent flood, which is partly a matter of climate, and partly a consequence of the superficial configuration and the character of the rocks in its basin. It is obvious that where a river basin is entirely composed of land with gentle slopes where there is little hard, impervious rock, the river must be much more constant in its flow than one whose basin is to a large extent composed of such rocks rising to hills and mountains with very steep slopes. The length and depth of unbroken navigation from the sea are also matters of great practical importance, and so also are the length and depth of the navigable stretches above the first break in the navigation.

**Lakes as Hindrances to Communication.**—As to lakes, similar considerations must be borne in mind in the study of communications, but with important differences. The geographical effect of lakes as hindrances to communication may perhaps be most effectively illustrated with reference to the situation of Winnipeg and Chicago. Both of these towns have grown up in recent times in a region in which there is an enormous amount of traffic between east and west, and where there are long lakes stretching with an aggregate, though not unbroken, length of upwards of 1200 miles from north to south. This gives special importance to the breaks in this series. One of these breaks is in a narrow strip running east and west between the south ends of Lakes Manitoba and Winnipeg on the north and the north end of the Lake of the Woods on the south. The consequence is that, for the present at least, the great bulk of the traffic between the east and the Canadian north-west is bound to pass through this funnel, and hence it was virtually inevitable that some important collecting and distributing centre should grow up somewhere in this funnel. Local circumstances served to fix that spot at Winnipeg. They determined the exact site, but the relations indicated determined, and are determining, its rapidly growing importance. It must be noted that the produce even of the fertile portion of the Red River valley to the south of Winnipeg, when conveyed to the east, must either pass northwards to get round the north of the Lake of the Woods, or southwards round the south of that lake. In the first case, it must pass through Winnipeg, and till recently this was the only route available. Before a route round the south of the lake was established, Winnipeg had become so important that the new route (the Canadian Northern) was bound to pass through that town and thus add to its importance.

The advantages of Chicago as a railway centre are even more obvious. An enormous amount of the railway traffic between the more populous parts of the north-east and the north-west of the United States is bound to turn the corner on which it stands. If the break between L. Superior and L. Huron had only been wider, a still greater proportion of that traffic would have been compelled to follow that route, but it is important to note in this connection that the fact that the St. Mary's River is narrow enough to be bridged, that it has in fact had a railway bridge since 1888, draws round by the north of L. Michigan a great deal of traffic that would otherwise have passed by the south.

**Lakes as Waterways.**—When viewed as obstructions to communication, lakes differ from rivers in being generally too wide to be bridged; but, on the other hand, this is in a large measure counterbalanced by the fact that they may be much more advantageous as waterways. Like the ocean, they can be traversed in any direction, and

[1] Hahn, *Die Städte der norddeutschen Tiefebene*, p. 105.

their importance from this point of view is in proportion to the extent and productiveness of the districts bordering their shores. On great lakes, too, the same speed may be attained as on the ocean. Many lakes are deep enough to accommodate the largest vessels, and some have traffic enough to fill vessels of a size which till the latter part of the last century were never seen even on the ocean. Vessels of more than 12,000 tons gross have been built for the great lakes of North America.

**Changes in Physical Features.**—Physical features are apt to be thought of as permanent, but the very existence of the science of geology is a token of their impermanence. Geological changes are, however, slow and mostly such as the geographer need not concern himself with, but it has long been recognised that they are due to causes which are constantly bringing about changes of a kind that the geographer cannot disregard. It is for that reason that the study of physical geography is as necessary to the geographer as to the geologist. The geologist notes, for example, that frost, wind, rain, and rivers are constantly combining to remove land from one part of the earth's surface and deposit it in another. The geographer has to consider what difference that makes in respect of the availability of the surface of the earth for the purposes of man, whether it aids in providing new land for cultivation, deprives him of such land, adds to or diminishes the fertility of land, silts up rivers and causes changes in their course, blocks up harbours, and so forth.

**CLIMATE. General Considerations.**—Under this head are considered the average conditions as regards temperature, humidity, and the precipitation of water in any form, whether as rain, snow, hail, or dew, and also as to salubrity. The last consideration expressly refers to the life of man, but under the other heads, too, there is always the same reference implied, though this reference is in many cases only indirect. The dependence of man on vegetation makes it essential to note not merely means of temperature but also how those means are brought about, whether they are the result of a moderate range of temperature throughout the year, or of great extremes of heat and cold at opposite seasons of the year, or even by day and night. Man can adapt himself to all extremes of temperature, but it is otherwise with most forms of plant life. The cotton plant, for example, is a perennial bush where the temperature allows of it, but it is most largely cultivated where the frost kills it every year. The coffee tree does not yield its fruit within a year, and must therefore be cultivated where the extreme temperatures of the year are such as it can stand, in consequence of which it is for the most part confined to the torrid zone. The tea-bush, on the other hand, is grown with success where it may be exposed to 20° F. of frost or more, and yet thrives as well as the coffee tree in equatorial latitudes. The effect of frost on vegetation generally makes it important to note, in regions liable to frost, the date of the first and last frosts of the year for long series of years, so as to enable one to form estimates of probability on this head. Where snow occurs regularly it is also important to note not merely the average amount of the seasonal fall, but the average date of commencement, and more particularly whether it is likely to occur before or after the first severe frost. It is, for instance, the snowfall that determines the fact that winter wheat can be cultivated in the Canadian province of Ontario, but not in that of Manitoba. In Ontario the snow comes before such frosts, and serves as a blanket to protect the sown wheat against cold; in Manitoba the severe frost comes first, and would kill the seed. It is also important to note the frequency and intensity of hail-storms and thunder-storms, the latter chiefly because of the heaviness of the rain with which they are accompanied. A rainfall of twenty-five or thirty inches in the course of the year has one significance where rain is seldom known to fall to the amount of two inches in twenty-four hours, quite a different significance where it may fall to the amount of from four to ten or twelve inches in the same period. Such rains are unfortunate for two reasons—first, on account of the violent floods they may cause, and second, because the water runs so rapidly from the ground that it is not available to the same degree for vegetation, except where it is controlled by irrigation works. Unfortunately, the lack of sufficient observations on some of these points is one of the most serious *lacunæ* in climatological data. Even where the data are adequate to characterise the climate of a region generally, it is important to bear in mind that the influence of the physical features may modify the conditions both of temperature and rainfall locally.

Inasmuch as all the climatic conditions of the earth depend primarily on the heat of the sun, the logical order in which to consider climatic factors would be first temperature and then precipitation. But the fundamental facts to remember as regards the action of the sun in relation to temperature are simple. They are two—first, that the effect of the sun is greater the more directly, that is, the more nearly perpendicularly, its rays reach the surface of the earth; second, that water, and more particularly the water of the ocean, is more slowly heated and more slowly cooled than the land. On the other hand, temperature is indirectly affected by various causes connected with the precipitation of water-vapour, and hence it is a more convenient order to deal with these subjects in the reverse order.

**The Winds as a Climatic Factor.**—But the detailed consideration of both of these subjects must be preceded by that of the winds, which are the sole carriers of heat and cold to different parts of the land surface of the earth, and the sole carriers of water-vapour from any part of the earth's surface to any other. Obviously, the winds must be considered in connection with the relations between sea and land, and with reference to this two things must be borne in mind. First, winds blow on the whole with more constancy and regularity over the level surface of the sea than over the land; and second, though heat, cold, and water-vapour that are introduced from the sea to the land may be carried farther into the interior by winds blowing in various directions, nevertheless the distance from the seaboard of the region to which they are carried must always be an important consideration. In what follows, therefore, it will always be supposed that the same winds as introduce heat, cold, and water-vapour into the land, carry them farther and farther into the interior; but it must be carefully noted that this assumption does not accord with facts, but is merely made for convenience of apprehension.

**Prevalent Winds. 1. The Trade-winds.**—The most constant winds of the globe are the trade-winds—winds that blow regularly over the Atlantic and Pacific Oceans, within and near the torrid zone, both north and south of the equator, as shown on Plate 5. It will be seen that these winds blow more or less from the east. In the Atlantic Ocean they are for the most part north-east winds north of the equator, and south-east winds south of the equator; but it will be noticed that they blow towards the Upper Guinea coast as south-west winds, but these south-west winds are strongest and most constant in summer, when the interior of North Africa is very hot, and the consequent diminution of atmospheric pressure brings about a strong indraught from the ocean. Over a wide stretch of the Pacific the trade-winds are almost due east. In the Indian Ocean there are corresponding winds all the year round to the south of the equator, but not to the north. The north-east and south-east trade-winds are separated by belts in which calms and variable winds prevail, the Atlantic belt being wider, especially in the east, than that of the Pacific. These calms occur in areas of low barometrical pressure, known to sailors as the doldrums.

**2. The Antitrade Winds.**—On the outer margins of the trade-winds calms and light winds prevail in the areas of high barometrical pressure, known to sailors as the horse-latitudes, round which the winds circulate, as shown on our wind-map, in opposite directions, it will be noticed, in the northern and southern hemispheres.

As the trade-winds blow on the equatorial side of these areas, there are winds that blow in the opposite directions on the polar sides. These are the antitrade winds, accordingly south-westerly and westerly in the northern, and north-westerly and westerly in the southern hemisphere, winds, therefore, which affect the western sides of the continents beyond the domain of the trade-winds, as the map shows. In the southern hemisphere, in which there is little land in high latitudes, these winds blow strongly from the west or north-west with remarkable strength and constancy, and are known to sailors, from the latitudes in which they occur, as "the roaring forties." In the northern hemisphere, on the other hand, it will be noticed that both in the Atlantic and Pacific Ocean the antitrades are part of a general atmospheric circulation round an area of low pressure of such a nature as to expose the western shores of Europe and North America to south-westerly or southerly winds, and the eastern shores of Asia and North America to northerly or north-westerly winds.

**Variations in the Position of the Trade-winds.**—The trade-winds do not blow all the year round in the same latitudes. Trade-winds, doldrums, and horse-latitudes all move north and south with the sun, and are thus farthest north in the northern summer, farthest south in the northern winter. Thus, in our summer the middle line of the doldrums extends from about Cape Verde, or about 15° N., on the west coast of Africa to about 10° N. on the east coast of South America; in our winter from about 6° N. on the west coast of Africa to about the equator on the east coast of South America. In our summer the north of Portugal and the north-west of Spain are exposed to more or less northerly winds, whereas in winter strong antitrades or south-west winds prevail on those shores, and even the shores of more southerly latitudes may be swept by antitrades sufficiently often to have their climate influenced by them in an important degree. Roughly, the latitudes between 30° and 40° N. and S. on the west sides of the continents are so situated that during the summer of the respective hemisphere the ocean winds blow strongly away from the land, except near the shore; whereas during the winter those parts of the land are more or less exposed to antitrades blowing from mid-ocean.

**3. Monsoons.**—In the north Indian Ocean and to the south-east of Asia in the Pacific, as well as in a less marked degree to the south-east of North America, the winds, if not reversed, are at least greatly changed in direction at the opposite seasons of the year. This change is most extensive and most marked in the Indian Ocean and the parts of the Pacific in the neighbourhood of the south-east of Asia from India to the shores of the Sea of Okhotsk. These are the regions of the monsoons, or seasonal winds, so called from the Arabic word *mausim*, meaning "season." In all this area the winds blow from the land to the sea during the winter months, from the sea to the land during the summer months. The direction of the wind in the same season necessarily varies in different parts. The monsoons are too frequently spoken of as south-west (summer) and north-east (winter) winds. But this usage is very misleading. It results from the fact that the phenomenon has been most closely studied, and is most frequently discussed, as it affects India. And yet these directions are not true even for the whole of India. In the Ganges valley the summer monsoon blows upwards—that is, it becomes a south-east wind; in the winter it blows downwards—that is, from the north-west. That, however, is a minor local phenomenon. Broadly, the direction of the wind depends on the relative situation of high and low barometrical pressures. The alternation of the monsoon winds is due to the alternation of relatively high barometrical pressures during the winter in the interior tablelands of Asia (Tibet, Eastern Turkistan, and Mongolia) as compared with the pressures at corresponding altitudes over the ocean, and the reversal of these relations during the summer. In winter the region of low pressure over the ocean lies to the south with reference to the high-pressure area in Tibet, and hence the winds tend to blow from north to south, but, undergoing the change in direction to the right, to which all movements on the surface of the earth in the northern hemisphere are subject owing to the rotation of the earth, become north-east winds. But in the same season, with respect to the high-pressure area over eastern Mongolia, the area of lowest pressure lies to the east in the northern Pacific—hence, in consequence of the same influence of the earth's rotation, we have north-west winds blowing across the Sea of Japan. The fact is that throughout this monsoon area the winter winds change on the whole—that is, apart from small local modifications—from north-east through north to north-west between India and the Sea of Okhotsk, and the summer winds from south-west to south-east, or even east. In the Indian Ocean during the winter a north-east trade-wind blows towards east Africa, but in the summer the wind is south-west, and blows strongly away from that shore. On the east side of North America land winds prevail during the winter, as in Asia, but in summer the prevailing winds, though changed in direction, do not blow so directly from the sea to the land, except round the Gulf of Mexico.

In the north of Australia the monsoon phenomenon is repeated on a smaller scale; but it is to be noted that whereas in the north and north-west the winds are completely reversed, as in Asia, a south-east wind which prevails during the winter months giving place during the summer to a north-west, in the north-east (Queensland) the change is from south-east to north-east, a consequence of the fact that in the southern summer the area of low pressure is in the middle of Australia. It is also to be noted that the air-pressures of Australia affect also the winds that blow over the islands to the north of that continent (New Guinea, Celebes, and the Lesser Sunda Islands); the winds there also are south-east and north-west alternately, but both more or less ocean winds.

**Occasional and Variable Winds.—1. The Harmattan.**—Though south-west winds would appear to be the prevalent winds off the coast of Upper Guinea all the year round, the direction is frequently reversed during the winter. A wind known as the harmattan or hamattan then blows not merely on the coast, but even far in the interior, generally from the north-east, but sometimes in some parts from the north-west. Sometimes it blows for days together intermittently with great violence, mostly in the early part of the day; at other times it blows more gently or subsides altogether. The period of its occurrence is from the end of October to April; but it blows most strongly and regularly about the middle of that period, from November to February, when the land is at its coldest.

**2. Cyclones and Anticyclones.**—While the trade-winds are constant or almost constant winds, and the monsoons, at least over the ocean, are nearly constant for the respective periods of the year, it is otherwise with the winds of higher latitudes. There what takes place is the repeated formation of centres of low barometrical pressure towards which the winds blow in spirally ascending currents, and corresponding centres of high barometrical pressure from which the winds blow in spirally descending currents. The low-pressure wind system is called a cyclone, and the high-pressure system an anticyclone. The direction of lateral movement of the winds is opposite in the two systems, and for each in the northern and southern hemisphere. For the northern hemisphere it is illustrated in the case of the cyclone by the circulation round the low-pressure area of the North Atlantic, and in that of the anticyclone by the circulation round the horse-latitudes; but it must be remembered that these represent only average or prevailing winds. An actual cyclone is always smaller in

extent than the area of circulation round the low-pressure centre shown, and is not so widely separated from its corresponding anticyclone, although the centre of cyclone and anticyclone are always many hundreds of miles apart. Such wind systems are not constant in position, but most usually have a slow more or less easterly movement as long as they last.

**Marine Currents.**—The constant and prevailing ocean winds produce surface currents which affect directly the temperature of different parts of the ocean, and indirectly that of the air over the ocean, and hence, through the agency of the wind, affect the climate of the adjoining land. North and south Equatorial Currents flow westwards in the domain of the trade-winds both of the Atlantic and Pacific, but between the two there is a return or counter-current flowing in the opposite direction. The opposing shores on the east sides of America, Australia, Asia, and the Asiatic islands cause the waters of the Equatorial Currents to be forced northwards and southwards, thus carrying relatively warm water into higher latitudes. The shape and situation of South America with reference to the Atlantic currents causes an exceptionally large body of warm water to be forced northwards, to pass through the Caribbean Sea, and, just entering the Gulf of Mexico, to pass out again to the north-east through the Straits of Florida or Bemini, and flow thence to the north-east. This is the Gulf Stream, which flows on as a distinct current to nearly 40° N. and 40° W. There it comes to an end, but under the action of the prevailing south-westerly winds great bodies of surface waters in the east of the Atlantic are drifted north-eastwards to the shores of Europe, on the north as far as Spitsbergen.

Cold currents, on the other hand, flow from Davis Straits southwards along the coast of Labrador round Newfoundland, and then close inshore along the coast of the mainland of North America; others pass southwards from Bering Sea and the Sea of Okhotsk round both shores of the Sea of Japan; and others on the west sides of continents affected by the trade-winds. These last are unquestionably in a large measure due to the fact that cold water rises to the surface to replace the surface water that is blown westwards by the trade-winds. They are specially important in the southern hemisphere—on the west side of Australia, on the west of South Africa, and on the west of South America from about 40° S. to near the equator. Both in the South Atlantic and the South Pacific a great body of relatively cold surface water is drifted onwards in low latitudes far to the west—in the South Atlantic to nearly 20° W., in the South Pacific to about 110° W.

**Precipitation.**—Let us now apply these facts to the consideration of the regions in which water in any form is precipitated on the surface of the earth, remembering that winds are the chief agents in distributing over the face of the earth water in all the forms in which it is present in the air, in that of invisible water-vapour as well as those of fog, cloud, rain, snow, and hail. The great original source of moisture in all its forms is the ocean. "All the rivers run into the sea; yet the sea is not full; unto the place from whence the rivers come, thither they return again."

**Evaporation and Condensation of Water-vapour.**—Water-vapour comes to be present in the air by the process of evaporation. This process goes on wherever there is a moist surface, and hence very extensively over the land, but naturally most extensively over the ocean, and much of the water-vapour which ascends from the ocean is carried to the land before it falls as rain or in any other form.

Evaporation goes on at all temperatures, but more rapidly at high than at low temperatures. There is a limit to evaporation when the air is said to be saturated—that is, contains as much invisible water-vapour as it will hold in a given volume at a given temperature. When air is saturated with water-vapour and the temperature is lowered, condensation of the vapour takes place; in other words, it is converted into mist or cloud, rain, snow or hail. When evaporation takes place heat becomes latent—that is, it is used in bringing about the change of state from a liquid to a gas, and is lost as a means of raising temperature. The temperature is lowered. When condensation of water-vapour takes place the so-called latent heat is given out. The temperature is raised.[1] Thus the process of evaporation tends to bring about a cause (the lowering of temperature) that checks evaporation, and the condensation of water-vapour tends to bring about one that checks condensation.

**Causes of the cooling which leads to the Condensation of Water-vapour.**—The great cause of evaporation is the heat of the sun, but in explaining the more or less sudden cooling to which the fall of rain or snow is due various causes have to be considered. Probably the most common cause of cooling that results in rain is the expansion of the air containing the water-vapour. An expansion or rarefying of air in the atmosphere is always accompanied by cooling,[2] as the compression or condensation of air is always accompanied by a rise of temperature. Very frequently the great cause of such an expansion of air as leads to rain is the obstruction offered to the winds by the inequalities of the surface of the ground. The winds being forced upwards, the air necessarily expands through being subjected to the pressure of a shorter column of the atmosphere. Similarly rain is apt to occur in a cyclone with its spirally ascending currents, especially, it is found by experience, on the side of the cyclone in the direction in which it is advancing; and, on the other hand, the condensation of air in the descending currents of an anticyclone is likely to prevent the condensation of the water-vapour carried by them in the sense in which water-vapour is said to be condensed when it is converted into a liquid. When the cooling of air is not due to its expansion, it may be caused by one wind meeting another at a lower temperature, or by a wind blowing over land where the temperature is relatively low, or by the loss of heat through radiation.

**Regions of abundant and deficient Rainfall.**—After this exposition compare the wind-map with the rainfall-map in Plate 5. It will be seen, first, that on the east sides of the land-masses in the zones in which trade-winds prevail over the ocean, there is a fairly abundant, in some parts a very abundant, rainfall, but on the west sides there are many degrees of latitude both north and south of the equator in which the rainfall is very scanty. This is a natural result of the fact that on the east side the winds in those zones blow in such a direction as to carry moisture to the land, whereas on the other side they tend to carry the moisture farther and farther out to sea. But it is obvious that there are great differences in the distribution of the rainfall in the parts compared, and it is certain that these differences must be in a large measure due to differences in the form, relative situation, and differences in the physical configuration of the continents compared. Observe that the low-lying parts of the basin of the Amazon form a vast area of very abundant rains. This is a natural

[1] Those who have a difficulty in apprehending these facts or appreciating their importance in relation to climate should consider that it is they which are practically applied in freezing machinery. In one form of such machinery, for example, ammonia-vapour is compressed into a liquid. Its temperature is thus greatly raised, but the temperature is brought down again by allowing cold water to play upon the pipe containing it. Minute quantities are then allowed to escape and evaporate in larger pipes, and that evaporation is the cause of sufficient cold to bring about freezing temperature (20° F. or lower) in large chambers. One may also consider whether it is in rainy or dry weather that one is most likely to do without a greatcoat in an English winter.

[2] This fact is applied in another form of freezing machinery.

result of the fact that the wide gap between the highlands of Guiana and those of southern Brazil admits both north-east and south-east trades far into the interior and that the lofty chains of the Andes in the west compel these winds to rise. When they are thus driven upwards it is to be expected that some of the water-vapour which they carry will be precipitated. But it may be pointed out that water-vapour may be introduced by one set of winds and precipitated by another. Cold westerly winds descending from the Andes may be the direct cause of rainfall, though not the cause of the abundance of water-vapour which is necessary to the production of copious rains, which is in agreement with the accounts of travellers in this region.

Observe, moreover, that the arid and, in fact, desert strip on the west side of South America extends much farther north than on the corresponding side of Africa—to within a degree of the Gulf of Guayaquil. This fact may also be connected with the influence of the Andes, which rise to such a height that even when the interior of South America is most strongly heated those mountains prevent the indraught thus brought about from affecting the winds of the Pacific. Off that coast accordingly the winds blow all the year round steadily seawards. But it should also be noted that not only here but also on the corresponding coasts of Africa and Australia the cold marine currents above mentioned contribute to the drought, inasmuch as they diminish the evaporation and cause such winds as blow inland to be charged with little moisture.

**Monsoon Rains.**—Note further that there is a fairly or very abundant rainfall in all the monsoon areas of the world, south-eastern Asia from India to the Sea of Okhotsk, the Eastern Archipelago, and the north of Australia, and that on the whole there is a diminution in the amount of the rainfall from the coast to the interior in the direction in which the winds blow; but in verifying this observation one must note carefully the prevailing direction of the ocean winds in the different parts of those areas, and bear in mind the influence of the physical features on the amount of the rainfall. One should note, for instance, the marked contrast between the copious rainfall on the western slopes of the Western Ghâts or Sahyādri Mountains in India and the rather scanty rains on the other side.

The rains of central and part of West Africa may also be classed as monsoon rains, and here attention must be drawn to the form of the continent as compared with that of America north of the equator. North Africa spreads out widely north and south of the Tropic of Cancer. In this area during the summer there must be a strong tendency to a great cyclonic movement of the air, which in the north of the Sahara would result in north-easterly winds tending to feed the north-east trade-winds of the Atlantic, but to the south of the Sahara would tend to strengthen the south-westerly winds which are shown to prevail off the Guinea coast. This would account for the rains of the Sudan, and even perhaps for the copious summer rains of the mountains of Abyssinia, which are known to be the cause of the Nile floods. Such a circulation would explain the exceptionally copious rains in the angle of the Gulf of Guinea, but another explanation must be looked for on the coast of Liberia and Sierra Leone, where also the rains are exceptionally abundant. There one must take into account the fact that this coast is contiguous at some period of the year to the doldrums or low-pressure belt of calms and variable winds, where the accumulation of water-vapour by local evaporation is so great.

Comparing the west coast of North America with the corresponding coast of Africa, one should notice that the area of moderate rainfall extends farther north on the American than the Saharan coast, and in connection with that one should observe the difference in the form of the continents. North of Cape Verde the African coast begins to recede, whereas the North American coast continues to trend north-westwards to about the parallel of 40°. The result is that to the north and north-west of southern Mexico and Central America there is a vast continental area which in summer is the cause of an indraught from the ocean, and the south-westerly winds thereby brought about suffice to counteract the trade-winds on the west of Mexico to such a degree as to bring some 20 inches of rain on the average to that coast as far north as the Tropic of Cancer. Here again, accordingly, are rains of a monsoon type.

**The scanty Rains of Part of Equatorial East Africa.**—The only part of the world in which there are very scanty rains on the east side of a continent in equatorial latitudes is in East Africa, where in the summer the winds, as already pointed out, blow strongly away from the land, and during the winter the north-east trades blow from colder latitudes to a relatively warm land, where the air is able to retain without condensation more water-vapour than those winds are able to bring.

**Rainfall of the Regions outside of the Trade-wind Zones.**—On the outer margin of the regions of deficient rainfall on the west sides of continents, the rainfall gradually becomes greater and greater in amount from lower to higher latitudes until beyond the 40th parallel of latitude; where that latitude is reached, the rainfall is everywhere copious on the coast, although it varies very greatly in amount in accordance with the character of the physical features. Even about the 35th parallel of latitude, although the total rainfall is scanty, we already find that the rainfall diminishes in amount from west to east.

The effect of the physical features on the rainfall is very marked in the parts of the world here referred to. Both in North and South America the high mountains parallel to and quite near the coast restrict the rains to very narrow strips, while in Europe the rains are allowed to penetrate far to the east, although in diminishing amount, except where the local distribution of the rain is modified by the superficial configuration.

**The Seasonal Distribution of the Rainfall.**—This is a very important climatic consideration. There are few parts of the world where the rainfall is fairly equally distributed all the year round, and in most parts of the world it is summer rains that predominate.

**Summer Rains** are characteristic of all those parts of the world which owe their rain directly or indirectly to the trade-winds, for it is in summer that those winds blow most strongly inwards. In a still more marked degree summer rains predominate for obvious reasons where monsoon rains prevail, and especially where they are most marked, in the south-east of Asia, although in considering the seasonal distribution of the rainfall one must carefully note differences in the distribution of land and water, of highlands and lowlands, with relation to the prevailing winds.

A predominance of summer rains is also characteristic of the interior of the great land-masses of the northern hemisphere, although in those regions the contrast of summer rains and winter drought is not generally so pronounced as in some parts of the monsoon areas and the areas under the influence of trade-winds. Still the tendency to this predominance begins to be noticeable even in the east of England, whereas on the west coasts in all higher latitudes the bulk of the rain takes place in autumn and winter.

**Winter Rains** and almost complete drought in summer are, however, the characteristic of all those western coasts that lie on the margin of the arid or desert tracts of the same coasts. This, for instance, is the characteristic of the Mediterranean region generally, and more particularly the southern parts of the Mediterranean, and there that seasonal distribution of the rain extends as far eastwards as the plains of Mesopotamia. At Baghdad, for example, where on the average of seven years the total rainfall was about 11 inches, almost the whole of that

amount fell between November and April. A similar distribution of the rainfall occurs in California, central Chile (about 30°—40° S.), round Cape Town, and in the south-west of Australia, and is a natural result of the fact that those parts are occasionally exposed in winter, but in winter only, to strong antitrade winds.

**Fogs.**—The condensation of water-vapour in the form of mist or fog is sometimes a matter of importance with respect to vegetation, but is of most serious consequence as adding greatly to the dangers of shipping. At sea fogs are frequent, and especially in those parts of the ocean where cold and warm currents approach one another or moisture-laden air is liable to be cooled by icebergs. These conditions, for example, contribute to make the banks of Newfoundland and the mouth of the St. Lawrence two of the most dangerous parts of the ocean on great highways of commerce.

**Distribution of Temperature.**—It is a natural consequence of the relation of sun-heat to terrestrial temperatures that there should be a decrease in temperature on the whole as we go from the neighbourhood of the equator towards the poles; but the temperature charts on Plate 4 indicate the fact that, in the temperate latitudes of the broad land-masses of the northern hemisphere, very great differences are observed as we go from west to east as well as from south to north—greater, on the whole, in the broader of the two great land-masses referred to (Europe and Asia combined, or Eurasia, as it is very often called), than in the narrower North America. A few data in the form of figures may assist in bringing the important facts home to the mind. In the following tables the places are arranged in such order that from left to right corresponds to from west to east.

*Average Mean Temperature in Degrees Fahrenheit*

EURASIA

Places between 50° and 52° N.

(The three western stations, all in a higher latitude than the three eastern, Valentia the most northerly of all.)

| | Valentia. | Greenwich. | Leipzig. | Saratov. | Semipalatinsk. | Blagovyeshchensk. |
|---|---|---|---|---|---|---|
| Longitude . . . . . | 10° 19′ W. | 0° | 12° 21′ E. | 46° 4′ E. | 80° 13′ E. | 127° 54′ E. |
| Altitude, feet . . . . | 11 | 155 | 390 | 230 | 590 | 390 |
| Coldest month . . . . | 45° | 39° | 31° | 14° | 6° | −13° |
| Hottest month . . . . | 59° | 63° | 65° | 71° | 73° | 73° |

Places in about 40° N.

| | Coimbra. | Constantinople. | Baku. | Peking. | Aomori. |
|---|---|---|---|---|---|
| Longitude . . . . . . | 8° 26′ W. | 28° 58′ E. | 49° 50′ E. | 116° 29′ E. | 140° 45′ E. |
| Altitude, feet . . . . . | 50 | ... | −72 | 35 | 33 |
| Coldest month . . . . . | 50° | 42° | 38° | 23° | 27° |
| Hottest month . . . . . | 71° | 74° | 80° | 79° | 73° |

NORTH AMERICA

Places in about 50° N.

| | New Westminster. | Lillooet. | Medicine Hat. | Winnipeg. | S.W. Point Anticosti. |
|---|---|---|---|---|---|
| Longitude, W. . . . . . | 122° 53′ | 122° 2′ | 110° 37′ | 97° 0′ | 63° 39′ |
| Altitude, feet . . . . . | ... | 650 | 2140 | 740 | ... |
| Coldest month . . . . . | 34° | 22° | 1° | −5° | 12° |
| Hottest month . . . . . | 61° | 68° | 68° | 66° | 58° |

Places in about 40° N.

| | Fort Humboldt. | Red Bluff. | Salt Lake City. | Denver. | Indianapolis. | Philadelphia. |
|---|---|---|---|---|---|---|
| Longitude, W. . . . . | 124° 10′ | 122° 15′ | 111° 54′ | 105° 0′ | 86° 6′ | 75° 10′ |
| Altitude, feet . . . . | ... | 340 | 4350 | 5300 | 750 | ... |
| Coldest month . . . . | 47° | 46° | 28° | 28° | 30° | 32° |
| Hottest month . . . . | 58° | 83° | 76° | 73° | 77° | 76° |

Attention may be specially directed to three points revealed by an examination of these figures; first, that the difference in the average mean temperature of the hottest month from west to east in all the four series is moderate as compared with that of the coldest month; second, that, although, so far as the figures show, greater extremes are reached in the east of Asia than in the east of North America, the decline in winter temperature within a given range of longitude is more rapid in North America than in Eurasia, the mean temperature of the coldest month sinking, for example, 39° F. within 26° of longitude between New Westminster and Winnipeg, as against only 33° F. within 56½° of longitude between Valentia and Saratov, and Indianapolis showing a drop of 17° F. within about 38° of longitude as compared with one of 12° F. at Baku within about 58° of longitude; and, third, that on the west side of America there are very abrupt differences in mean temperature, either in summer or winter or both, within a slight range of longitude.

The explanation of these differences is to be found in the relations of sea and land, in the prevailing winds, and in the character of the physical features.

The fact, already mentioned, that, for various reasons, the sea is more slowly heated and cooled than the land, leads to the result that in winter the sea is warmer, in summer colder, than the adjoining land. This has an influence on the temperature of the adjoining land, but the operation of that influence cannot be understood unless one bears in mind that without the wind the influence of the sea on temperature would not penetrate one inch inland, unless therefore one considers the behaviour of the winds. The fact that both land-masses are exposed on the west side all the year round to prevailing westerly (mainly south-westerly) winds, accounts for the relatively mild winters and cool summers on that side; and as regards the winter winds, it is to be borne in mind that their warming influence is enhanced by the fact that they blow from lower latitudes (in so far as they are south-west winds), and that they are rain-bearing winds leading to the liberation of much latent heat, and in the case of Europe that they blow over seas that are exceptionally warm in consequence of the direction of movement of the surface waters, and that the superficial

configuration allows of those influences penetrating far into the interior. In North America the arrangement of the physical features is the reverse. There lofty mountains rise within a short distance of the coast, and to a large extent cut off the influence of ocean winds. Hence the great difference in the temperature of the coldest month at New Westminster and Lillooet, within less than a degree of longitude. But while the west sides of the continents in the latitudes considered are exposed more or less to ocean winds all the year round, the east sides are exposed in a large measure to land winds, and in any case to northerly winds, whether from sea or land, during the winter, and to southerly winds during the summer. Hence the cold of winter is enhanced by two influences, whereas the cooling effect of the ocean winds of summer is in a large measure reduced, if not nullified, by the fact that they come from lower latitudes. This should prevent exaggerated ideas as to the influence of the sea on temperature. In the four series given above all the places farthest west and east except Blagovyeshchensk are on or quite near the coast, and it will be noticed that they all have higher winter and lower summer temperatures than the nearest inland places for which particulars are given, but that this is very far from being true in winter if the comparison is extended to inland places near the west side. On the east side, even on the sea coast, as at Anticosti, Philadelphia, and Aomori, a great range of temperature, due to very cold winters as compared with those of the west, is characteristic.

As regards the summer, one may note that in the regions affected by south-westerly winds from the ocean, there are conflicting influences which account for the fact that the differences in temperature from west to east are generally less at that season than in winter. The winds are cooling winds, inasmuch as they come from the ocean, but warming winds in so far as they come from lower latitudes—warming, too, in so far as they are rain-bearing and thus lead to the liberation of latent heat, but by day indirectly cooling in so far as they are accompanied by clouds which keep off the sun, a consideration obviously more important in summer than in winter. In the relatively high summer temperature of Lillooet as compared with New Westminster, we may see not merely the direct effect of the intervention of the mountains in keeping off cooling ocean winds, but also in keeping off clouds (by causing the condensation of water-vapour to take place chiefly on the west of the mountains), while yet allowing the valley to experience the influence of winds warmed by the latent heat arising from that condensation. The more striking difference between the summer temperatures of Fort Humboldt and Red Bluff, the former on the coast, the latter in the Californian valley, is due to the fact that the intense summer heat of the valley, sheltered against northerly winds by the Sierra Nevada and other mountains, is enough to bring about an indraught of air from the neighbouring sea, not enough to cause rain, but enough to cause a prevalence of mist.

In the lower latitudes the range of temperature is less than in the northern series, but the influence on temperature of the arrangement of the mountains and highlands in North America and Eurasia respectively is very marked, both in summer and winter. The plains between the Appalachians and the Rocky Mountains allow of cold winds from the north sweeping down to the shores of the Gulf of Mexico, and, on the other hand, of hot waves, as they are called, advancing far to the north. The mean temperature of January at Brownsville, the most southerly town in the United States, in about 26° S., is 59° F. as against 61° F. at Patna, in the same latitude on the plains of the Ganges. This difference is not indeed great, but it is enough to show that exposure to cold northerly winds more than counterbalances the favourable influence of a position on a warm inland sea, as contrasted with a situation far inland but enjoying the advantage of protection against northerly winds. A more striking illustration of the difference is perhaps to be found in the fact that 14° F. of frost has been registered at Brownsville, whereas the lowest reading recorded at Patna in ten years was 36.4° F. Then again, on the 20th of January 1906, the thermometer recorded 72° F. at St Louis, and in Cleveland and other cities of Ohio there were cases of heat prostration.

The effect of the cold currents on the west side of the southern continents on the temperatures of the adjacent land is shown by the fact of there being rather lower temperatures on that side than in corresponding latitudes on the east. It is due to the fact that gentle sea breezes blow on that side, if not for the most part, at least from time to time, even though the direction of the wind far out at sea is the reverse.

**Altitude and Temperature.**—In the case of land temperatures altitude, as is well known, has to be taken into account as a modifying influence. Here the danger is an exaggerated idea of the influence referred to due to familiarity with the fact of a snow-line on high mountains. A knowledge of the causes of lowered temperatures at high altitudes should serve as a protection against such misconceptions. It is not that the sun exercises a smaller influence at high than at low altitudes of solid bodies exposed to it. The reverse is, of course, the truth. But the rarefied air of high altitudes is less readily heated by the sun's rays directly, and, what is even more important, such air allows of the heat reflected from the surface of the earth passing through it without raising the temperature all the more when it is dry, as it is very apt to be at high altitudes. High altitudes, we have seen, promote precipitation, and water-vapour that is condensed and precipitated is no longer in the air. Hence at high altitudes the mean temperature of the air is apt to be greatly reduced by the loss of heat by radiation at night. Much depends, too, on the character of the superficial configuration. The greater part of the heat of the air is derived from the dark rays, as they are called, reflected from the earth's surface. Hence the lowering of the mean temperature is likely to be more rapid the more isolated a mountain is, and is not likely to be very great on broad tablelands. Elevated spots on mountain-sides are not only far from the source of the dark rays reflected from the general surface of the earth, but they are also apt to be exposed to ascending, and hence expanding and cooling, winds. All the places for which mean temperatures are given above at high altitudes on the North American continents are on tablelands, and it will be noticed that the altitude has no very marked effect in lowering the temperature, either in summer or winter. The difference of 1400 feet in favour of Winnipeg, as compared with Medicine Hat, is not sufficient to check the easterly decrease in winter temperature, and the summer temperature at Medicine Hat is actually above that of Winnipeg. The mean temperature of the coldest month at Indianapolis is not much above that of Denver, which is as much above Indianapolis in altitude as Ben Nevis is above the level of the sea; and there is no difference worth speaking of between the mean temperature of the hottest month at Indianapolis and Salt Lake City, which is as much above Indianapolis in altitude as Snowdon is above the level of the sea. The mean temperature of the coldest month (January) at Simla, in about 31° N., at an altitude of more than 7000 feet, is 41° F., or four degrees higher than the corresponding mean temperature at Zikawei, near Shanghai, in about the same latitude, but little above sea-level, and within a short distance of the sea. At Simla the high altitude and interior situation, sheltered, however, from northerly winds, have not the same effect in lowering the winter temperature as the exposure to northerly winds at Shanghai. The difference in the hottest month, however, is great, at Zikawei 81° F. (July), as against 67° (June) at Simla; but at this season we have to consider that Simla is exposed to ascending winds, accompanied by much rain and cloud (on the average, more than 60 per cent. of the sky overcast in June, 85 per cent. in July).

**Salubrity.**—On this subject there is not space to say much. Generally it may be said, that for Europeans the most unhealthy regions are those parts of the tropics which have a humid atmosphere with much stagnant

water. It has recently been ascertained that the malaria which characterises such regions is directly communicated to man by mosquitoes, and it is a matter of very great geographical importance, as likely to enhance enormously the value of such regions, which in virtue of the moist heat are naturally very productive, that this discovery has led to the waging of successful battle with the mosquitoes and the malaria which they propagate. By way of illustration, it may be mentioned that the mouth of the Klang River, where Port Swettenham now stands, was a hotbed of malaria in 1900, but after the measures adopted there to obliterate the breeding-places of the malaria mosquito, the days of sick-leave granted to officers diminished from 1026 in 1901, to 71 in 1904. Similar results have been achieved in other infected parts of the tropics and sub-tropics.

**ECONOMIC DEVELOPMENT OF THE WORLD.**—A survey having now been taken of the permanent geographical conditions on which economic development depends, it is necessary, in order merely to indicate the nature of the problems of economic geography, to give a sketch, however brief, of the economic development of the world.

**The Two Chief Regions of Development.**—The present economic stage of the world may be said to be the result of two different lines of development in two different regions, one in the region of summer rains in the south-east of Asia, the other originally in the region of winter rains round the Mediterranean extending to the plains of Mesopotamia. Such civilisation as existed in parts of the New World was completely destroyed by that which arose round the Mediterranean, and can scarcely be said to have affected the current of development.

**The Region of Summer Rains.**—Of the two regions above indicated, that of summer rains was and is peculiarly favourable to agricultural production, and the temperate portion of the area, embracing China, especially northern China, and Japan, with their severe winter climate, is also highly favourable to vigour of body and mind and assiduous labour. Hence in these parts of the world civilisation, as indicated by agricultural production, manufacturing skill, and political organisation, attained a high degree of perfection, such as, in China, for instance, filled with just amazement the minds of western travellers from Marco Polo at the end of the thirteenth to the Jesuit missionaries at the beginning of the eighteenth century. But in recent times the whole of this region has been far eclipsed by the west in the instruments of mechanical production and transport.

**The Region of Winter Rains.**—In this region the earliest civilisations belonged to areas dependent not directly on rain but on irrigation, the Nile valley and the plains of Mesopotamia, this name being used for the nonce in a wide sense to designate the banks both of the Tigris and Euphrates. Thence civilisation gradually spread westwards till it reached a temporary culmination in an empire that embraced all the shores of the Mediterranean. When this empire fell its civilisation had a continued existence and development in the powers which took its place, and which were long more or less united by the influence of the Church.

**Relations between the two Regions.**—Though on the whole these two regions followed separate lines of development, they were not without influence on each other. From a very early date the east was of special importance in the economic development of the west, but the west was till recently of much less importance in relation to the east. The influence of the east on the west was the result of a trade of small bulk but high value, such as that in precious stones, ivory, fine woods, and spices, the only kinds of commodities which could bear all the costs (including the risks) of transport over long distances in those days. Of all the commodities of the east that found their way to the west, pepper may be singled out as the most important, because the cheapest and hence the most widely diffused of the spices, and that which therefore yielded the greatest aggregate profit. For thousands of years the trade in pepper put enormous profits in the hands of Mediterranean merchants, whether of Tyre and Sidon, Alexandria, Venice, or Genoa, and of other merchants who in turn traded with these. It was not that more of such commodities were used then than now, but the difference in the values in the country of origin and that of final sale left a great surplus for those who were fortunate enough to escape all the risks of the trade. Hence much wealth—that is, much command of labour—was put into the hands of a few individuals. This gave a surplus for enterprise which led to the development of manufactures of costly wares in metal, textile fabrics, glass, &c., in the centres of trade, and the successive development of districts near the coast which could supply, chiefly by sea and navigable rivers, food and raw materials for such centres.

**The Routes between East and West.**—The spices of the east were brought to the west almost exclusively by two routes, one up the Red Sea and one up the Persian Gulf. The Red Sea route seems at first to have terminated in Egypt, and not to have led through Egypt to the Mediterranean. The shores of this sea were reached by way of the Persian Gulf and routes across the desert where it is narrowest, namely, between the upper Euphrates and the Phœnician seaboard. Hence the long-continued importance of Tyre, Sidon, and other Phœnician cities, perhaps the most remarkable instance in the history of the world of commerce without empire, and yet probably the instance in which commercial leadership has been most enduring. After the foundation of Alexandria Egypt became a rival transit-land, and at times even the chief transit-land for eastern commodities to the Mediterranean, and it remained so in the middle ages under Mohammedan rule, though Cairo was then the centre of trade rather than the decayed Alexandria or Damietta. As long, however, as a wealthy population was found in Mesopotamia the Phœnician seaboard could not wholly lose its commercial importance, and, though Sidon decayed, Tyre revived, and, with Beirut, was a great seat of eastern trade far on into the middle ages.

**Trade across the Alps.**—But by this time the wealthiest centres of trade were in northern Italy. Even before the end of the western Roman Empire the great plains of northern Italy were beginning to acquire that wealth and importance which their geographical conditions promote, and were conferring a like importance on the seaports which serve as their outlets, above all on that seaport which could be most easily reached without the crossing of mountains, the eastern outlet of Aquileia. Aquileia was completely and for ever destroyed in the fifth century, but her daughter Venice ultimately entered into her inheritance and greatly enlarged it. In the west, too, the mountain barrier did not form an insuperable obstacle to the trade of Genoa, when the wealth of the interior became great enough to repay the costs of mountain transport. Even the loftier barrier of the Alps could be crossed by commodities of high enough value. Across Alpine passes pepper was passed onwards from both Genoa and Venice to go down the Rhine or the Elbe, though the chief terminal ports at the other end were neither on the Rhine nor the Elbe, but in the one case Bruges and Ghent, in the other Lübeck. Bruges and Ghent derived special advantage from their proximity to England, as well as other circumstances, and in connection with this it may be mentioned that English wool was then a commodity of high enough value to be carried across the Alps to feed the manufactures of Milan and Florence. Lübeck, again, had the advantage of being the nearest port on the Baltic to the pepper routes, so that from it pepper was distributed to all the ports round the Baltic and the parts surrounding that region which were most easily reached by Baltic ports.

**Discovery of the Seaway to India, and of America.**—Seeing that such valuable trade was so long carried on with the east by routes which partly placed the trade at the mercy of foreigners, and hence, at the very least, made the trade subject to exactions which greatly enhanced the Mediterranean prices of eastern wares, it is not to be wondered at that the idea of finding a seaway to India should have arisen in the minds of western merchants. An attempt to do so was made from Genoa as far back as 1291, but the attempt failed and was forgotten. Not till the fifteenth century were continuous attempts made to achieve this end, and, indirectly at least, the credit of final success in this achievement must be ascribed to Prince Henry the Navigator, as he is called, one of the sons of King John I. of Portugal and a great-grandson of the English King Edward III. At first, it is true, the only commercial aim of Prince Henry was to find another route to the country which supplied the gold-dust and ostrich feathers that came to Morocco; but it is clear that the possibility of reaching the Indies round Africa was already in his mind about 1441, when he asked from the Pope a concession in perpetuity of whatever lands might be discovered from Cape Bojador to the Indies inclusive. The discovery, however, was not made till 1497–9, nearly forty years after the death of Prince Henry, when the successful voyage of Vasco da Gama resulted in the bringing back to Lisbon direct from India a cargo of pepper and other spices which brought a profit of 6000 per cent. Five years before the inception of this voyage—that is, in 1492—the search for a seaway to India by a western route across the ocean had resulted in the discovery of America by Columbus.

**Results of the Discovery of the Seaway to India, and of America.**—The immediate results of the discovery of the seaway to India were more important than those of the discovery of America. The chief result was a change in the route by which eastern commodities were supplied to a large part of Europe. Spices brought first to Lisbon were afterwards disseminated through northern and central Europe by merchants of the Low Countries, who came to buy them there. But for a long time there was little change in the nature or even in the total amount of trade with the east. When the English East India Company was founded at the close of the sixteenth century, it was because the Dutch had raised the price of pepper on the London market, and the greater part of the cargo brought back on the first voyage of the East India Company was 450 tons of pepper. About that time, it is true, one bulky commodity, rice, was already known in England, but Shakespeare makes it plain that it was held to be very dear: "What will this sister of mine do with rice? But my father hath made her mistress of the feast, and she lays it on." The most immediate result of the discovery of America was the pouring into Europe of hitherto unheard-of quantities of the precious metals; above all, silver from Mexico and Peru—that is, Upper Peru, the present Bolivia. Only slowly was settlement made in North America—by the French on the banks of the St. Lawrence, where a trade in furs, an article of sufficient value to cover heavy costs in transport, was developed; by English agricultural colonies in New England, and afterwards at the mouths of the Hudson and Delaware; and by English planters using negro slave-labour on the estuaries of the rivers of Maryland and Virginia. In 1670 the English Hudson Bay Company had a monopoly of the trade in furs in the region approached by that bay conferred upon it, and about the middle of the eighteenth century French fur-traders had posts as far west as the head of Lake Superior and south-west on the banks of the middle Mississippi, but there was no close settlement west of the Appalachians.

**The Industrial Revolution.**—But in the latter part of the same century there took place in England a number of inventions which have brought about a change in the conditions of manufacturing industry and of commerce, and an acceleration of the rate of the economic development of the world, to which all previous history presents no parallel or approach to a parallel. It is a change that has affected the entire world, bringing about an entirely new trade with the New World and the antipodes, and completely altering the character of the trade with the east, depriving spices of the peculiar value which they held in commerce for so many centuries, and developing a trade of incomparably greater magnitude with the east than was at one time ever dreamt of, and largely in commodities of a bulky character yielding comparatively little profit on small quantities. The revolution was inaugurated by the inventions in connection with the cotton industry between about 1769 and 1785 and the concurrent improvements in the steam engine by James Watt, who thereby first made this a generally serviceable machine. These were followed by the introduction of steam locomotion by land and water in the first quarter, and the rapid extension of these modes of transport in the remainder of the nineteenth century. The result of these inventions was to give a new value to the stores of coal and iron in the United Kingdom, and ultimately a new value to undeveloped land in new countries. It was railways that first made it possible to fill great ships with bulky produce like grain drawn from the far interior. The remarkable expansion of commerce thus brought about greatly increased the commercial advantages of Great Britain due to its situation and local facilities for shipping. In so far, however, as the unexampled development of British manufacturing industry and commerce in the period immediately following the industrial revolution was due not to geographical conditions but merely to the fact that the great inventions originated there and consequently the resources of Great Britain for carrying on manufactures by the new methods were developed first, the expansion of British manufactures and commerce was bound to be affected by the development of similar resources elsewhere; and the more rapid growth of manufactures in some rival countries resulting from this cause, and partly, it may be, from other causes, has been one of the marked features of recent economic history.

**Illustrations of the Broad Results of Development since the Industrial Revolution.**—It has been mentioned above that the first English cargo brought from the East Indies consisted of about 450 tons of pepper. In 1905, the quantity of wheat alone exported from India (largely to England) was considerably more than 2,000,000 tons, or not far short of five thousand times as much as the cargo of 1603. Cincinnati began to be laid out amidst a dense forest of maples at the end of 1788. Now all the cheap land of the United States has been agriculturally settled, and farmers with capital from that country are pouring into the prairies of the Canadian North-west. In 1879 there was not a single mile of railways in those prairies. Now there are thousands of miles, and the land is being so rapidly taken up that, according to an estimate made by Mr. M'Kellar, deputy Minister of Agriculture in Manitoba, in 1902, if the entries for homesteads and sales of railway land should go on at the same rate as in the year ending June 30, 1902, all the available agricultural land of the north-west will have been allotted in ten years from that date. In 1883 the area under wheat in the Argentine Republic was little more than half a million acres, in 1905–6 it was above 14,000,000 acres. These figures cannot but remind us of the far-seeing warning of Sir William Crookes, in his presidential address to the British Association at Bristol in 1898, as to the approaching exhaustion of the wheat-fields of new lands, and it is probably one of the most important economic facts of the present time, that his suggestion of the manufacture of nitrogenous compounds for fertilisers, with the aid of atmospheric nitrogen, is already being carried out by various methods in different countries. From a geographical point of view it is important to note that this new industry will primarily affect the wheat-fields of the older settled countries rather than those of new lands.

# DESCRIPTION AND GEOGRAPHICAL DISTRIBUTION OF THE PRINCIPAL COMMODITIES OF COMMERCE

By W. A. TAYLOR, M.A., F.R.G.S.

**Abaca,** the Spanish name for **Manila Hemp** (*q.v.*).

**Abietine,** a hydrocarbon distilled from the *Pinus sabiana* of California. It is used as a substitute for benzine.

**Acajou,** the fragrant wood of *Cedrela Brasiliensis*, imported in logs about 16 feet long. The name is used by the French for mahogany.

**Acetic Acid,** prepared by the oxidation of alcohol and also by distillation of wood, the crude acid being called pyroligneous acid. Vinegar is a diluted acetic acid. *See* also **Sugar of Lead** and **Verdigris.**

**Aconite,** the root and leaves of *Aconitum napellus*, imported for medicinal purposes. The alkaloid aconitine is a very powerful poison, prepared from *A. ferox* and *A. napellus*.

**Acroides,** a fragrant yellow resin obtained from the *Xanthorrhea hastilis* of Australia, and used in varnishes and for the manufacture of picric acid.

**Adansonia Bark.** *See* **Baobab.**

**Agar-Agar,** marine fuci used in China as food and to stiffen fabrics.

**Agaric,** certain fungi used in dyeing and as styptics.

**Agave,** a genus of plants chiefly growing in Central America. *See* **Pulque** and **Sisal Hemp.**

**Ajowan Seeds,** the fruit of *Carum ajowan* and *C. Copticum*, which are used in India as a condiment, and yield an infusion and oil very similar to thyme oil, and of value as a stomachic medicine. *See* also **Thymol.**

**Alabaster,** a variety of gypsum or selenite. It closely resembles marble, but is softer. Pure alabaster, such as that of Volterra in Tuscany, is of a delicate white or tinted colour, and is translucent. Derbyshire also yields a good quality. Oriental alabaster is a variety of marble worked in Egypt in ancient times into jars, &c.

**Alaska Sable,** the fur of the skunk, *Mephitis mephitica*, made into muffs and boas.

**Albumen.** Animal albumen is obtained from the serum of blood and from eggs, and is used in calico-printing and photography.

**Alcohol.** Common, or ethyl, alcohol, $C_2H_6O$, is obtained by the fermentation of sugar in grain and other substances. Absolute Alcohol is the pure spirit; Rectified Spirit contains 16 per cent. of water; and Proof Spirit 50.76 per cent. For excise purposes it is spoken of as so many degrees under proof (U.P.), or over proof (O.P.). *See* also **Methylated Spirits** and **Spirits.**

**Alcornoque Bark,** the bark of the American trees *Byrsonima laurifolia* and *Bowdichia virgilioides*, used in tanning.

**Ale.** *See* **Beer.**

**Alewife** (*Alosa tyrannus*), a fish of the shad family, of which enormous numbers are caught in the rivers of New England, Nova Scotia, and New Brunswick.

**Alfa, Halfa.** *See* **Esparto.**

**Algaroba,** the pods of *Prosopis dulcis*, used in Mexico for cattle food, and also as a tanning material. *See* also **Carob Beans.**

**Alizarine,** a dyeing material, found originally in madder (*alizari*), but now obtained from anthracene, the least volatile of the coal oils. It is deposited in long red crystals.

**Alkalies,** soluble hydroxides which neutralise acids and are used in industries, such as the salts of potash and soda, ammonium and lime. British alkali, or soda, is exported in large quantities.

**Alkanet,** the root of *Anchusa* or *Alkanna tinctoria*, exported from the Levant. It yields a beautiful but not very durable dye known as Alkanna Red.

**Alligator Pear.** *See* **Avocado Pear.**

**Alligator Skins.** Several thousand skins of the Mississippi alligator are sold annually in London and made into leather. The skins of the young animals are soft, and are best when they measure 6 to 8 feet in length.

**Alloys,** compounds formed by two or more metals. The union is almost always effected at a high temperature, except in mercurial alloys, called amalgams (*q.v.*). When lead, tin, zinc, and cadmium enter into the composition, the alloy exhibits the qualities of its constituents, but the alloys of other metals show certain peculiarities. Their specific gravity is not the mean of that of their components, and their electric conductivity is not determined by the relative volumes of their components. As a rule alloys are harder, more elastic, and more easily fusible than simple metals. The most useful alloy in manufactures is brass, compounded of copper and tin in various proportions. *See* **Brass.** Copper and tin produce also bronze, bell-metal, gun-metal, and speculum metal. With the addition of phosphorus phosphor-bronze is formed. German-silver is composed of zinc, copper, and nickel, and Britannia metal of tin, copper, and antimony. Pewter is an alloy of tin and lead; type-metal of lead, tin, and antimony; and fusible metal of tin, lead, and bismuth. Aluminium bronze consists of aluminium and copper. Alloys of platinum, iridium, &c., are also used in small quantities. *See* also **Gold** and **Silver.**

**Allspice.** *See* **Pimento.**

**Almonds,** the fruit of the almond tree (*Amygdalis communis*), exported from Italy, Morocco, and Spain, and grown also in France. Bitter almonds grow on trees originally wild. An oil is extracted from sweet almonds.

**Aloe Fibre,** the fibre of *Fourcroya gigantea*, long and silky and stronger than hemp. It is exported from Mauritius. The Fourcroya is allied to the agave, and the fibres are often sold together.

**Aloe Wood.** *See* **Lign Aloes.**

**Aloes,** the inspissated juice of several species belonging to the order of Liliaceæ. The best, the Socotrine aloes, come from Socotra, Bombay, the East Indies, and Zanzibar, and are obtained from the *Aloe vulgaris*. Mokha aloes are extracted from *A. Perryi*, Cape aloes chiefly from *A. ferox*, and Barbados and Curaçoa aloes from *A. vulgaris*. The best Socotrine aloes are rich in colour and translucent; hepatic aloes are darker and opaque; and caballine aloes are the coarsest or refuse. The active principle is a crystalline substance called aloin.

**Alpaca Wool.** Under this name are included the fleeces of the vicuña and guanaco, as well as of the alpaca itself, animals of the sheep family living in the Andes. It is largely used in the worsted manufactures of Yorkshire. About 5 million lbs. are imported.

**Alpiste,** the French name for canary seed.

**Alum.** Common potash alum (aluminium potassium sulphate), and ammonia alum, in which ammonium takes the place of potassium, are extensively used by dyers and calico printers.

ANNUAL PRODUCTION OF ALUMINIUM (1902)
7,640 tons, Value £1,243,000
UNITED STATES £476,000
SWITZERLAND £250,000
FRANCE £188,000
U. KINGDOM £80,000

**Aluminium,** a metal contained in clay, felspar, and many other rocks. It is extremely light, with a specific gravity (2.56) barely one-third that of iron, is white in colour, nearly as hard as fine silver, does not tarnish, and takes a high polish. These qualities render it a suitable material for scientific instruments, medals, personal ornaments, travellers' boats, &c. Aluminium forms several alloys with copper, one of which, the ordinary aluminium bronze, has a yellow colour and has been made into pencil-cases, watch-chains, &c. With tin it is used in optical instruments, and, combined with silver, is manufactured into spoons and forks. Aluminium is now made from bauxite (*q.v.*) and cryolite, and about 7380 tons are manufactured in the year, chiefly in the United States (3260 tons), Switzerland. and France, though lately the industry has been developed in Scotland (Falls of Foyers), and also in England. *See* Plate 138–9.

**Amalgams,** the alloys formed by the union of mercury with other metals. Mercury will unite with gold and silver at ordinary temperatures, and is employed in separating the precious metals from their ores. It dissolves the metal, leaving the earthy particles. Gold amalgam is used to a small extent in gilding, the mercury being driven off by heat. Tin amalgam is employed in the manufacture of looking-glasses.

**Amber,** the fossil resin of a coniferous tree, obtained chiefly from the Baltic, off the coast of Pomerania, Prussia, and more rarely in the North Sea, between Jutland and the Dutch frontier. The production in 1902 was 895,943 lbs.

**Ambergris,** a secretion from the intestines of the sperm whale, used in perfumery. It is found floating on the sea off the coasts of China, Japan, Sumatra, Madagascar, and Brazil.

**Amboyna Wood,** a beautiful reddish-brown wood that grows in India and the Moluccas, and is used for inlaying. It is the wood of *Petrospermum Indicum*.

**Ambrette.** *See* **Musk Plants.**

**American Cloth.** *See* **Leather Cloth.**

**Ammonia,** a volatile alkali. Carbonate, bicarbonate, chloride, and sulphate of ammonia are articles of trade. The last is often used by farmers as a top-dressing.

**Ammoniacum,** a gum resin that exudes from the roots of *Dorema ammoniacum*, a plant of Persia and Turkestan. It is made into a cement for porcelain, and a medicine.

**Anchovy,** a small fish (*Engraulis encrasicolus*) caught in the Mediterranean, and salted or preserved in oil. The best come from Leghorn.

**Andiroba Oil.** *See* **Carapa.**

**Angelica,** an umbelliferous plant (*Archangelica officinalis*), of which the roots, fruits, and stems are used in confectionery, medicine, &c. The finest extract comes from Niort, Deux-Sèvres, in France.

**Angora Wool.** *See* **Mohair.**

**Angostura,** the bitter bark of *Galipea officinalis*, which grows abundantly in Venezuela. It is used as a tonic and febrifuge, and in the manufacture of bitters. False Angostura bark is obtained from *Strychnos nux vomica*. The name Angostura was that of the present Ciudad Bolivar, but the bitters are now manufactured in Trinidad.

**Aniline,** a brownish oily liquid obtained from coal-tar, which forms the basis of many beautiful dyes.

**Animals.** *See* **Cattle, Sheep, &c.**

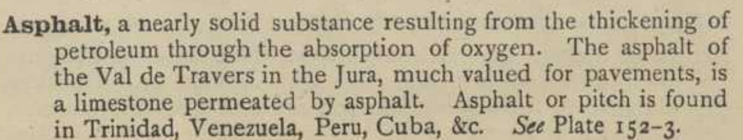
**Anime,** a resin, the product of *Icica icicariba*, a Brazilian tree. African copal, from *Trachylobium Mozambicene*, and American copal, from *Hymenæa courbaril*, are also known in England as anime.

**Aniseed,** the fruit of an umbelliferous plant, *Pimpinella anisum*. The best quality is greyish-green in colour, and comes from Malta and Spain. It is also produced in Touraine, Russia, and Italy. The seeds are used in the manufacture of anisette, absinthe, and other cordials, and the essential oil as a condiment and medicine. Star aniseed, the fruit of *Illicium anisatum*, of the family of the Magnolaceæ, is used for similar purposes. It grows wild in China, Tonkin, and Japan, and is cultivated in Java and the Philippines. Large quantities are exported from China. The wood is used in marqueterie.

**Anisette,** a liqueur, which derives its aroma chiefly from aniseed. It is largely manufactured in France, and is shipped from Bordeaux. Dutch anisette is less sweet, and contains more alcohol.

**Annato,** or Arnotto, a dye-stuff made from the reddish pulp of the seeds of the *Bixa orellana*, a plant which grows in Central America. It is much used in France for dyeing silk.

**Anthracite,** a very hard shiny coal containing 80 to over 90 per cent. of carbon. It burns with a little flame, but gives off a large amount of heat, and is therefore used in furnaces for the production of steam. Anthracite occurs in several European countries, but the most important mines are in South Wales and Pennsylvania. *See* Plate 130–131.




**Antimony,** a shiny bluish-white metal, very brittle. The trioxide, valentinite, in crystalline needles, is extracted at Sensa in Algeria, Sarawak in Borneo, and in Japan, and most of the metal produced in Great Britain is obtained from these ores. The sulphide is found in England, Saxony, France, &c. Antimony is mixed with other metals to give them greater hardness—in type-metal, bell-metal, &c.

**Apatite,** natural phosphate of lime mixed with calcium chloride or fluoride; found in large quantities in Canada and near Stavanger in Norway. *See* **Lime.**

**Apples.** Apples are an important crop in Worcestershire, Herefordshire, and Devonshire, where they are made into cider. American apples, chiefly Baldwins, Greenings, Russets, and Newtown Pippins, are shipped to this country. The quantity imported annually varies considerably. The average during the years 1897–1901 was 3,095,700 bushels. *See* Plates 97–100.

**Apricot.** This tree is of the same order as the pear. It was introduced into Europe from Armenia, and it grows wild in China also. In France the fruit is made into pulp or candied, especially at Clermont-Ferrand. Pulp and dried and tinned apricots are also exported from California. The kernel possesses properties resembling those of bitter almonds, and is used in the fabrication of ratafia and noyau, and an oil, *huile de marmotte*, is expressed at Briançon.

**Aquamarine,** a precious stone of nearly the same chemical composition as the emerald, but less valuable. It has a pale green colour. The best stones come from Ceylon, but the stone is also found in Siberia and Brazil.

**Archil,** a violet-red paste made from various lichens, especially *Roccella tinctoria* and *fuciformis*, and used in dyeing. Archil liquor is prepared by ammonia and heat from a decoction of the lichen. *See* also **Cudbear** and **Orchella.**

**Areca-Nut,** the betel-nut so much used for chewing in the East, the fruit of the *Areca catechu* palm and certain leguminous shrubs. A very small quantity of nuts is imported into Great Britain, where they are used only for tooth powders.

**Argentite,** silver sulphide, occurring in cubic crystals and called silver-glance.

**Argol,** the crust formed in wine-casks. It is a bitartrate of potash, and when pure is a fine white crystalline powder or colourless crystals. Several hundred tons are exported annually from Portugal for dyeing. The red argol, deposited from red wine, is used for the darker shades.

**Argus,** the feathers of the argus pheasant (*Argus giganteus*), a native of Siam, the Malacca peninsula, and the neighbouring islands; are used as ornaments.

**Arnica,** a plant of the composite order (*Arnica montana*). A tincture made from the flowers is used to dress wounds.

**Arrack,** a spirit made from various species of palm; a favourite drink in the East.

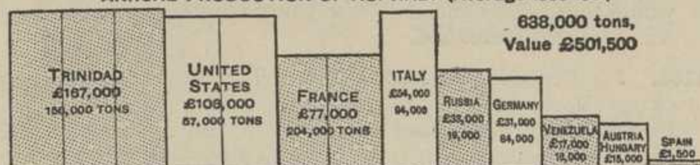
**Arrowroot,** a starchy substance derived from the rhizomes of various plants. True arrowroot is obtained from the *Maranta arundinacea* of the West Indies and South America, and is exported chiefly from the West Indies. The Bermudas produce a fine quality. Indian arrowroot is made from the roots of *Curcuma leucorrhiza*. Queensland arrowroot is from *Canna edulis*. *See* also **Tous-les-Mois.**

BRITISH SUPPLY OF ARROWROOT (Average 1902-04)
29,000 cwts.
£39,000 value.
BRITISH WEST INDIES
£35,000 27,800 CWTS.
OTHER BRITISH POSSESSIONS
£4,000
1,500 CWTS.
FOREIGN
£100

**Arsenic,** a steely-grey substance with a metallic lustre. White arsenic or arsenious acid is manufactured in England and Germany as a green dye for wall-papers and for other purposes. The sulphate and other combinations are used in medicine. Arsenic is obtained in a pure state and combined with cobalt. This mineral, white cobalt, occurs in Saxony, Bohemia, Hess, and Thuringia. The arsenical sulphide, or cobalt-glance, comes from Norway and Sweden. The amount of arsenic obtained annually is about 7700 tons, a large part of this quantity being extracted in England (Cornwall and Devon), and nearly as much in Germany. *See* also **Orpiment.**

**Asbestos.** There are two forms of asbestos, the one a brittle, fibrous hornblende, known as amianthus, which is not affected by acids; and the other, chrysotile or serpentine asbestos, which is affected by acids, but is very elastic. The former occurs chiefly in Italy and Austria, while the latter is found abundantly in the province of Quebec, Canada. Asbestos is woven into fireproof cloth for covering steam-pipes, rendering buildings fireproof, for stuffing boxes of engines, &c. Canada produces about 37,000 tons annually, and Russia is the next largest producer, with about 3900 tons.

**Asphalt,** a nearly solid substance resulting from the thickening of petroleum through the absorption of oxygen. The asphalt of the Val de Travers in the Jura, much valued for pavements, is a limestone permeated by asphalt. Asphalt or pitch is found in Trinidad, Venezuela, Peru, Cuba, &c. *See* Plate 152–3.




**Assafœtida,** a gummy resinous exudation from the roots of *Ferula assafœtida* and *Ferula orientalis*, umbelliferous plants which are natives of Persia and the Ural steppe, and are cultivated at Herat. It has a disagreeable odour and a bitter taste. In India it is used as a condiment and medicine; in Europe only as the latter.

**Attar of Roses,** an essential oil distilled from roses, especially from the petals of *Rosa Damascena*. Kazanlik, in Eastern Rumelia, is one great centre of the trade. Attar or otto is also distilled in the N.W. Provinces of India and the Punjab, and is shipped to England. As about 3000 lbs. of rose-leaves yield only an ounce of oil, pure attar is very expensive.

**Avignon Berries,** the fruit of *Rhamnus infectoria*, which yield a yellow dye. This buckthorn is grown in the south of France. *See* **Yellow Berries.**

**Avocado Pear,** or Alligator Pear (*Persea gratissima*), a fruit tree of the Lauraceæ order, which grows in the West Indies and West Africa. It yields an oil used as an illuminant and in soap-making, and from the seeds a marking-ink is obtained.

**Babul Bark.** *See* **Mimosa.**

**Bacon.** *See* **Swine.**

**Badger** (*Meles taxus*), a carnivor of the weasel family. It lives in Europe up to lat. 60° N. and in Central and Northern Asia. The American badger (*Taxidea Americana*) is a different genus. The skins are used as furs, and the hair is made into brushes.

**Bael Fruit,** the fruit of the Bengal quince (*Ægle marmelos*), a kind of orange. It is an astringent medicine, and also yields a perfume and a yellow dye.

**Bag.** *See* **Sack** and **Gunny.**

**Baize,** a coarse woollen cloth used for coverings and wrappers.

**Bajra.** *See* **Millet.**

**Balachong,** a compound of small fish and shrimps seasoned with spices. It is extensively used as a condiment in the East, particularly in China.

**Balata,** a gum obtained in Venezuela and Guiana from the *Mimusops balata*. *See* **Gutta-Percha.**

**Baleen.** *See* **Whales.**

**Balsams,** oleo-resinous substances used in medicines and perfumery. The most common are Peruvian balsam, obtained from the *Myroxylon pereiræ*, a tree of the order of the Leguminosæ, which grows on the coast of Salvador; balsam of Tolu, the product of *M. Toluifera*, which grows in Venezuela, Ecuador, and Brazil; Canada balsam, used for mounting microscopic objects and varnishing water-colours, which is obtained from a fir (*Abies balsamea*); copaiva balsam, derived from various species of copaifera, and shipped chiefly from Bahia, Para, and Maracaibo. It is used as a medicine and in the manufacture of printers' ink.

**Bamboos,** a huge grass which grows in the East Indies, China, and Japan, and also in the West Indies, whither it is said to have been introduced from the East. There are many varieties of bamboo, some attaining a height of 70 to 100 feet, with a diameter of 15 to 16 inches. To the natives of the East the bamboo is a most valuable plant. Water-pipes, bridges, furniture, ladders, masts, &c., are made of the stems, while the fibres are woven into mats, ropes, and sails. The young shoots are eaten as a vegetable, and the young roots are made into pickles, which are imported into Europe under the name of *achiar*. In Europe the stems are used for light furniture, walking-sticks, &c.

**Bananas,** the *Musa sapientum* of the order of Musaceæ, an herbaceous plant cultivated throughout the tropical and subtropical regions. Though an herb, its stem, composed of the sheath stalks of the leaves, rises sometimes as high as 25 feet. The fruit, in bunches, averaging 25 lbs. in weight, is the chief substitute for corn in tropical countries. The unripe fruit is often cooked, especially that of the more mealy kinds. Large quantities of bananas are exported from the West Indies, Central America, and the Canary Islands, and the flour is an article of trade, particularly in South America. The imports into the United Kingdom in 1905 exceeded 5½ million cwts., for which over £2,000,000 were paid. The *Musa ensete* of Abyssinia does not yield an edible fruit, but its stem is cooked as a vegetable. The *Musa textilis* yields Manila Hemp (*q.v.*). *See* Plates 97–100.

**Bandanas,** a kind of handkerchief originally made in India, but now exclusively in Great Britain. The handkerchief is first dyed, and the pattern is then made by removing the colour with bleaching liquor.

**Bankul Oil,** obtained from the nuts of the *Aleurites triloba*, a large tree of the order of Euphorbiaceæ. The tree is cultivated in Ceylon, the Moluccas, in several of the South Sea Islands and in the Hawaii Islands. The nuts, the size of a walnut, contain about 62 per cent. of oil. The Polynesians used the nuts strung on rushes as a means of illumination, and therefore they are well known as candle nuts. *N.B.*—The candle-nut tree must not be confused with the candle tree, so named because of the *shape* of its fruits.

**Baobab,** the Monkey Bread tree (*Adansonia digitata*), a native of tropical West Africa, but now introduced into the East and West Indies. The pounded leaves are used as a medicine. The bark yields a strong fibre, and is used for making ropes and paper.

**Barcelona Nuts,** a name for the hazel-nuts (*Corylus Avellana*) imported from Spain.

**Barège,** a thin fabric of silk and wool, named after the town Barèges in the Pyrenees, in the neighbourhood of which light woollen fabrics, somewhat similar in appearance, are made. Barège, however, is made in Picardy. In England cotton is sometimes substituted for the silk.

**Barilla,** an impure carbonate of soda obtained from plants growing in salt marshes. In Spain and the Balearic Islands it is obtained from *Salsola sativa*, in France chiefly from glass-wort (*Salicornia herbacea*). The manufacture has declined, for soda can now be made from common salt. *See* also **Kelp.**

**Barium.** *See* **Baryta.**

**Bark.** The barks of many trees are used for tanning. Oak barks (*Quercus robur* and *pedunculata*) are most used in Europe, as they contain 7 to 11 per cent. of tannin. Chestnut bark is also esteemed, and tanners in Spain use the inner bark of the cork oak. Several kinds of oak bark are used in the United States, but the bark most used there and in Canada is that of the Hemlock spruce (*Tsuga Canadensis*). Bark extracts of mimosa bark, chestnut bark, and pimento twigs are also articles of commerce. *See* also **Cinchona, Cinnamon, &c.**

**Barley.** *See* Plate 76.

**Barwood.** *See* **Camwood.**

**Baryta** or Barytes, oxide of barium obtained from heavy spar (sulphate of barium) and witherite (carbonate of barium). Hamburg White, Dutch White, and Venice White are mixtures of sulphate of baryta and white lead. Large quantities of them are used in glass, porcelain, and colour manufactures. Germany is a large producer, and the mineral is worked also in the United States and Westmorland.

**Basils,** a name for tanned sheep-skins.

**Basse.** *See* **Perch.**

**Bast** or Bass, the inner soft bark of a tree. In Russia mats are made of the bast of the lime, which are exported in large quantities, and the same bast is used in the south of Europe to make hats. *See* also **Piassava.**

**Bastards,** moist sugar mixed with some molasses, which remains after loaf-sugar has been made.

**Bath Bricks,** bricks weighing about 3 lbs. each, made of a calcareous earth found near Bridgewater. They are used for cleaning and polishing.

**Bath Stone,** a creamy-coloured limestone quarried in Somersetshire and Wiltshire. It is easily dressed but is not very durable.

**Batiste,** the French name for cambric.

**Battens,** planks of fir timber, used for flooring, roofing, &c. The best are imported from Norway.

**Bauxite,** a hydrated oxide of aluminium from which aluminium is extracted. It takes its name from Baux in France, and it is also found in Styria, Ireland (Antrim), the Southern States of America, and elsewhere. The output in 1902 was about 134,680 tons, valued at £6583. Of this France produced 71 per cent., the United States 22 per cent., and the United Kingdom 7 per cent.

**Bay.** The fruits of the sweet bay (*Laurus nobilis*) are used in veterinary medicine. A concrete oil is extracted from them, and the leaves are used in condiments. For **Bayberry** *see* **Candleberry.**

**Bay Salt,** the impure salt obtained by evaporation from sea-water.

**Bdellium,** a gum-resin, weaker than myrrh but more acrid. It is obtained in India from *Amyris commiphora*, and in Senegal from *Balsamodendron Africanum*. The Dum palm (*Hyphæne Thebaica*) yields the Egyptian bdellium.

**Beads.** A large quantity of beads are made, especially in Italy, Holland, France, and Germany, of glass, porcelain, coral, &c. Most of them are shipped to Africa for barter with the natives. Several kinds of ornamental seeds and nuts are strung and used as necklaces, bracelets, &c.

**Beam Tree,** the White Beam (*Pyrus aria*), allied to the Service tree, yields a yellowish close-grained wood much used for turning.

**Beans.** By this name the seeds of the common or broad bean (*Faba vulgaris*), the French or kidney bean (*Phaseolus vulgaris*), and the scarlet runner (*P. coccineus*) are commonly intended. Broad beans are exported from Egypt, Russia, Italy, Turkey, and the United States. Bean meal is given as fodder to horses and cattle. Haricot beans are in France preserved in jars, and the dried beans are extensively used as food. In tropical America beans are a very favourite dish. The fruits of various other leguminous plants are called beans, as soy beans, Tonka beans, &c., and of plants of other orders.

**Bear.** Bear-skins are exported in large numbers from America. They are chiefly skins of the black bear (*Ursus Americanus*), but those of the white polar bear and of the grizzly bear (*Ursus horribilis*) are also used. In the Old World the brown bear (*Ursus arctos*), found in Northern Russia and Siberia, yields a valuable fur.

**Bear Grass.** *See* **Yucca.**

**Beaver,** a rodent inhabiting the streams of Russia, Poland, Siberia, and North America. There is only one species, the *Castor fiber*, the *Castor Canadensis* being only a variety. They are hunted for their skins, especially in Canada and Alaska. The finest are taken in Labrador.

**Bêche de Mer,** a sea-slug, called trepang in the East. Several species of Holothuriæ are known by this name. They are caught in the Eastern Archipelago and off the north coast of Australia, and are imported into China as an article of food.

**Bedda Nuts,** small myrobolans (*q.v.*).

**Beech,** the wood of the beech tree, though rather hard and brittle, is used for furniture and turned articles, &c. Being very durable under water, it is employed in the construction of mill sluices. The mast yields an oil eaten as a salad oil in Germany.

**Beef.** *See* **Meat Supply** (Plates 65–68).

**Beer.** *See* Plate 93.

**Beeswax.** Bees are kept and the wax collected in most countries of Europe. Wax is also exported from America, many parts of Africa, including Madagascar, and from India, Asia Minor, &c. East Indian wax is of poor quality, being the produce of wild bees. The wax is exported either in its natural condition, when it is yellow, red, or even brown or grey, and bleached. It is bleached by being formed into thin strips, spread in the sun, and watered, or by the aid of chemicals. It is used for candles, floor polish, in varnishes, calico-printing, &c.

**Beetroot,** a plant of the order of Chenopodiaceæ. The common beet (*Beta vulgaris*) is cultivated in gardens, and its red tap-root is eaten as a vegetable. It is the same species which is cultivated for the extraction of sugar (*see* Plates 77 to 80). Mangold-wurzel is a coarser variety (var. *cicla*) grown as food for cattle.

**Beige,** the French name for undyed wools, and also given to fabrics partly of dyed and partly of undyed wool.

**Belladonna,** or Deadly Nightshade (*Atropa belladonna*), a herbaceous plant of the order Solanaceæ, which grows in all parts of Central and Southern Europe. Belladonin and atropin, alkaloids obtained from all parts of the plant, are highly poisonous. They are used as medicines, internally in small doses, and externally in the form of liniments and plasters.

**Beluga,** the white whale (*Delphinapterus leucas*). *See* **Porpoise.**

**Benedictine.** *See* **Liqueurs.**

**Benjamin.** *See* **Benzoin.**

**Ben Nuts,** the fruits of various species of *Moringa*, a tree of the order of Capparideæ, and also known as the Horseradish tree. The *Moringa pterygosperma* grows in India, Java, and Réunion; the *Moringa aptera* in Egypt and Arabia. The latter yields an oil used by watchmakers and perfumers.

**Benniseed,** a name given in Africa to the seed of the Sesamum (*q.v.*).

**Benzene** or Benzol, a light hydrocarbon obtained by distillation from the lighter oils of coal-tar and petroleum. It is used in the preparation of varnishes, in the cleaning of textile materials, &c. Nitro-benzol is the essence of mirbane or artificial oil of almonds used in perfuming soap.

**Benzine.** *See* **Naphtha.**

**Benzoin,** usually known as Gum Benjamin. A gum obtained from the *Styrax benzoin*, a tree which grows in Indo-China and Sumatra. The best comes from Siam. Benzoin is used in perfumery, pastilles, incense, and in the preparation of soaps and washes. The Compound Tincture of Benzoin (storax, tolu, and aloes) is the Friars' Balsam, or Jesuits' Drops, frequently applied to wounds.

**Bere.** *See* **Barley** (Plates 74 to 76).

**Bergamot,** a species of orange or lime (*Citrus Bergamia*), named after Bergama, the ancient Pergamos, in Asia Minor. The tree is now cultivated in Italy and Sicily for the sake of its essential oil, which is manufactured at Palermo and Messina. The oil is used in pomades, essences, and perfumes.

**Beryl,** a silicate of aluminium, of greenish, bluish, orange, and yellow tints. It is found in the United States, Brazil, Ceylon, &c. *See* also **Emerald.**

**Betel.** For Betel-Nut *see* **Areca-Nut**. The betel leaf is the leaf of the *Chavica betle*, of the order Piperaceæ, indigenous to the Eastern Archipelago, and cultivated in India, Burma, Siam, and other countries. It is used in chewing betel-nut, the nut with some shell lime being wrapped in a betel leaf.

**Bhang,** the Indian name for hemp. In the East the leaves and stems are used as a narcotic, being either smoked or made into drinks and electuaries.

**Bichrome,** bichromate of potash, which is obtained in the form of large red crystals, and is used in dyeing and making painters' colours.

**Bird Seed.** Under this name are included hemp, canary, millet, rape, and poppy seed, sold to feed birds.

**Bird-Skins.** A large quantity is imported into Europe for the decoration of ladies' bonnets. Pheasants, tanagers, birds of Paradise, humming-birds, and the egret or white heron are sought after for this purpose.

**Birds' Nests,** the gelatinous nest of the swiftlets of the genus of Collocalia; are imported into China to be used as food.

**Bismuth,** a white metal with a tinge of red, found in most of the countries of Europe, Siberia, and America. It is used to make fusible alloys, one of which is composed of two parts of bismuth, one of lead, and one of tin. The trioxide is used in porcelain manufacture, the subnitrate, known as Pearl White, or Powder, and Blanc d'Espagne, is used as a cosmetic, and, as well as the subcarbonate, in medicine.

**Bitters,** tonic alcoholic drinks, which owe their bitter flavour to orange, quassia, gentian, aloes, &c. Angostura bitters are well known.

**Bitterwood,** a name given to some species of Xylopia, particularly the *X. glabra* of the West Indies, and also to the *Picræna excelsa* of the order Simarubaceæ, a native of Jamaica. This contains the same bitter principle as the *Quassia amara*, and now supplies most of the quassia used in medicine.

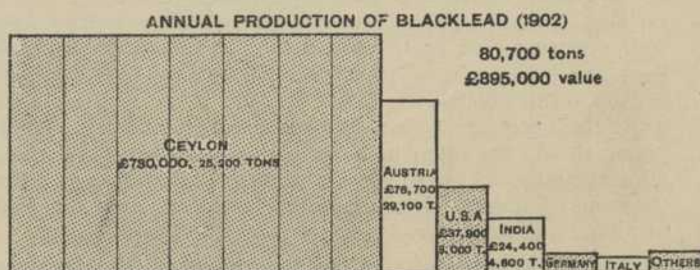
**Bitumen.** *See* **Asphalt.**

**Black Beer,** another name for spruce beer. *See* **Beer.**

**Black Boy Gum,** the gum obtained from the Australian grass tree, *Xanthorrhea Australis*. It contains benzoic and cinnamic acids.

**Blacking,** a paste used to impart a black, shining surface to leather. Bone black, some sugar and oil, and concentrated sulphuric acid are the constituents. Harness blacking consists or beeswax, turpentine, copal varnish, ivory black, &c.

**Black-Lead,** Graphite, or Plumbago, a mineral consisting chiefly of carbon, with the addition of alumina, silica, lime, &c. The mines of Borrowdale in Cumberland formerly yielded excellent black-lead which could be used for pencils in its natural state, and the graphite from a mine at Bogodolsk, in Eastern Siberia, is almost equally good. Generally, graphite is mixed with clay and is made into pencils and crucibles, and used for polishing iron. Ceylon is now the most important source of the mineral, and the quality is fairly good.




**Blackwood.** *See* **Rosewood.**

**Bladders,** the urinary vessels of animals are exported from America and the continent of Europe in barrels. They are used to contain lard and other commodities.

**Bleaching Powder,** a mixture of chloride of lime and hypochlorite of lime, used in bleaching calicoes and in paper-making.

**Blende,** zinc sulphide. *See* **Zinc.**

**Blood.** Blood of animals is used in dyeing, sugar-refining, &c. It is also a source of albumen and other substances.

**Blooms,** bars of malleable iron produced by blast-furnaces from the ore or from pig-iron.

**Blubber,** the thick coating of fat which covers the bodies of whales, seals, and other polar animals, and yields a valuable oil. *See* **Whales.**

**Blue.** *See* **Ultramarine, Cobalt, Indigo, Prussian Blue,** and **Alizarine.**

**Bluestone,** Sulphate of Copper, or Blue Vitriol, which occurs in veins of copper and iron pyrites and is manufactured from copper sulphide. It is used by dyers and calico-printers, in electro-plating, &c.

**Bobbinet,** or Bobbin-net, machine-made net.

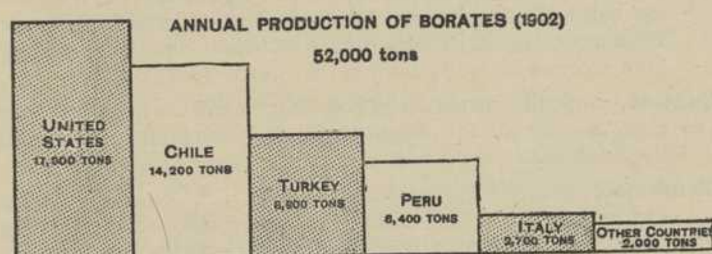
**Bohea,** the commonest black tea, so named from a range of hills in southern China.

**Bole,** a clayey earth, consisting of silica, alumina, red oxide of iron, and water. Armenian bole is most common in trade, and is used to colour tooth-powders and adulterate cocoa, &c., and as a veterinary medicine.

**Bones.** These are a not unimportant article of trade. They are chiefly used as a manure, as they contain phosphate of lime and other salts. Bone-ash is formed into cupels (vessels used in assaying) and in pottery, and phosphorus is made from it. Bone black is used in sugar-refining and in ironworks.

**Boots and Shoes,** exported largely from Germany, France, and England. Massachusetts is a great centre of manufacture for the United States. In the years 1902–4 the exports from the United Kingdom averaged 766,122 dozen pairs, valued at £5,323,826.

**Borax,** Biborate of Soda, obtained chiefly from California, especially from the marsh in Saline Valley, and Chile. In India it is called *tincal*. Borax is also made from boracic or boric acid, which is found in Tuscany in the pools formed at the mouth of fumaroles. Borax and boracic acid are indispensable in many industries, in glazing pottery, fusing metals, &c. *See* Plates 136, 137.




**Bort.** *See* **Diamond.**

**Botany Bay Resin,** a resin obtained from a species of Xanthorrhea. *See* **Acroides.**

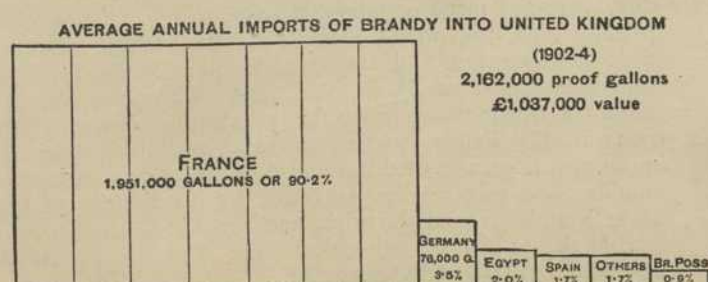
**Bottles.** The great manufacturing countries are Belgium and Germany. Large quantities are also exported from Great Britain. Bottles are now made in the United States and Great Britain of paper, varnished inside to resist the action of acids, alcohols, &c. In 1904, 681,562 gross of glass bottles were exported from the United Kingdom, worth £423,364.

**Bowstring Hemp,** the fibre of *Sanseviera Zeylanica*, a plant of the order Liliaceæ. It is used in the East Indies for bowstrings. The fibre of *S. Guineensis*, which grows abundantly on the west coast of Africa, also goes by this name.

**Boxwood,** the common box (*Buxus sempervirens*), grows in Central and Southern Europe, North Africa, Western Asia, and Eastern Asia. The wood is heavy and compact and is used for wood engraving, the manufacture of wind instruments, &c. It comes chiefly from the Caucasus, Turkey in Asia, and Persia. The Minorca box (*B. Balearica*) is inferior. *B. microphylla* of Japan yields an excellent wood. A true box, *B. Macowanai*, grows at the Cape, but hardly any is cut.

**Bran.** *See* **Flour.**

**Brandy.** Genuine brandy is a spirit distilled from grape juice. Its manufacture on a commercial scale began in France early in the 16th century. The best, known as Cognac from the town of that name, is made in the department of Charente, the various qualities being distinguished as *fine champagne*, *grande* and *petite champagne*, &c. Next come the brandies of Charente Inférieure, of the districts of Gers, Montpellier and Languedoc, and in Burgundy and Franche-Comté spirit is made from the pulp of grapes from which the wine has been pressed out. Spain also exports brandy, and, indeed, wherever wine is made, brandy is generally manufactured, though often of inferior quality. Much of the brandy now sold is made of potato spirit, beetroot, malt, prunes, &c., though it frequently bears the name of Cognac. France produces annually about 3¼ million gallons of wine brandy, Spain 142,000, and the United States about 3 millions. *See* Plates 90, 91.




**Brass.** By this name an alloy of copper and zinc is usually intended. In pinchbeck brass these metals are in the proportion of 4 : 1; in Dutch metal 3 : 1; in yellow metal 2 : 1; in Muntz's metal (for sheathing ships) 3 : 2. Brass is also alloyed with lead, zinc, and tin to form stopcock and other metals. *See* also **Bronze.**

**Brazil Nuts,** the seeds of the *Bertholletia excelsa*, a tree belonging to the Lecythidaceæ, a sub-order of the Myrtaceæ. The fruit capsule is round and woody and divided into four compartments, each containing six or eight nuts. The nuts are exported from Para, Brazil, and French Guiana. They yield a burning oil. The average export from Brazil in 1903–4 was 339,278 bushels, valued at £339,278.

**Brazil Wood,** the dark-red or yellowish-brown dye-wood obtained from various species of *Cæsalpinia*. *C. Brasiliensis* and *crista* are natives of the West Indies; *C. echinata* is the Pernambuco wood of Brazil, Nicaragua wood, or Lima wood; and *C. sappan* comes from the East Indies.

**Brazilian Grass.** *See* **Chip.**

**Breadfruit Tree,** *Artocarpus incisa*, a native of the East Indies, but now introduced into America. It yields an edible fruit and a soft yellow wood with the appearance of mahogany. The Jack or Jaca (*A. integrifolia*), cultivated in the Antilles, supplies Jacqueira wood, used for building and furniture. A kind of dammar is obtained from the sap, which also is a source of caoutchouc.

**Briar Root.** The briar-root of which pipes are made is the root of a large heath (*Erica arborea*) which grows in Corsica, Algeria, and Spain, and in small quantities in the South of France. The chief seat of the manufacture is at Saint-Claude in the Jura. The roots of the *Smilax rotundifolia*, a climbing plant of North America, are also used for pipes.

**Bricks,** blocks of clay moulded and burned. English bricks measure 9 × 4½ × 3 inches. The colours, cream to dark red, are due to the varying quantities of iron in the clay. Blue bricks are produced by controlling the supply of air during the firing. Bricks for decoration are made in particular forms, glazed, &c., and some bricks made in Norfolk and Suffolk can be ground down smooth or even carved. For fire-clay bricks *see* **Clay.**

**Brill,** a flat fish (*Rhombus lævis*) akin to the turbot, but inferior in flavour. It is caught off the coasts of England and the Continent.

**Brimstone.** *See* **Sulphur.**

**Briquette,** a kind of fuel composed of coal dust and pitch cemented together by steam and compressed into a brick shape by powerful rams. Tar, asphalt, grease, spoilt flour, &c., have been used as cement. Briquettes will smoulder for a long time, and give out as much heat as coal.

**Bristles,** the bristles of the hog and wild boar are used in making brushes, and by saddlers and shoemakers. Leipzig is the great centre of the trade in bristles, a large quantity of which come from Russia. China also exports a considerable quantity of rather inferior quality.

**Britannia Metal,** an alloy usually composed of 80 to 90 per cent. of tin, with varying quantities of antimony and copper and other metals. Tea and coffee pots, hot-water jugs, and many other utensils are made of this metal, a thin sheet of Britannia metal being impressed in a lathe on to a wooden model.

**Broadcloth,** a fine woollen fulled cloth made into men's suits. It is about 30 inches wide.

**Brocade,** a figured silk in which one or more threads are inserted by a shuttle which travels only the breadth of a leaf or flower, and thus produces the design in relief. Gold, silver, or gilt thread is often used.

**Bromine,** a chemical element in the form of a dark reddish heavy liquid. It is the only element besides mercury which is liquid at ordinary temperatures. It is found in combination with sodium in sea-water and in some springs, as those at Kreuznach and Kissingen in Germany. The largest output is from the salt mines of Stassfurt, twenty miles from Magdeburg. The bromide of potassium and hydrobromic acid are used in medicine, and the former as well as bromide of silver in photography.

**Bronze,** an alloy of copper and tin, to which small quantities of other metals, as zinc, lead, or silver are frequently added. Five to ten parts of copper to one of tin make gun-metal, used for bearings and other parts of machinery where a hard material is necessary, and two to four parts of copper to one of tin is the composition of bell metal. Phosphor-bronze has the advantage of being more homogeneous. It consists of 7 to 8 per cent. of tin, phosphide, copper, and ¼ to 2½ per cent. of phosphorus. *See* also **Aluminium.**

**Broom,** a name given to several species of Leguminosæ, suborder Papilionaceæ. The common broom (*Cytisus scoparius*) is abundant in Europe and Northern Asia, and owes its name to the fact that it is used to make besoms. Spanish broom (*Spartium junceum*) furnishes a fibre for making canvas, nets, and ropes, and its twigs can be used in basket work. Brooms

are also made from the American broom-corn (*Sorghum vulgare*) (durra), and from *Andropogon muricatum* mats and window blinds are made.

**Brushes.** Brushes are made from bristles (*q.v.*), horse-hair, goats' hair, badgers', camels', and sables' hair, &c. Also from vegetable fibres, as the American agave (*Agave Americana*), the palm (*Caryota urens*, kittul fibre), bass or piassava fibre (*q.v.*), esparto grass, &c.

**Buchu,** or Bucku, the Hottentot name for some evergreen aromatic shrubs of the order Barosma, natives of Cape Colony. The leaves are used as medicine.

**Buckskin,** a leather made from deer or sheepskin rendered very soft and pliant by repeated soakings in cod-oil. Also called doeskin. Buff leather is made in a similar manner from South American cow and ox hides. Imitation buckskin is a strong twilled woollen cloth with the nap cut off.

**Buckwheat** (*Fagopyrum esculentum*) is grown in Europe, especially Normandy and Britanny, Holland, Belgium, Denmark, and Russia, and in North America. It is very nutritious, and is a favourite food in the United States in the form of thin cakes. It is a good food for horses, cattle, and poultry, and is frequently used in gin distilleries. Another variety (*F. tataricum*) is extensively grown in Canada. Dyer's buckwheat (*Polygonum tinctorium*) yields a blue dye little inferior to indigo.

**Bugles,** glass beads in a pipe form, made in Austria and Italy for trimmings.

**Bukkum Wood,** a name in India for sappan wood (*q.v.*).

**Bullion,** gold and silver in bars and ingots.

**Bunting,** a thin woollen material of which flags are made.

**Burgundy,** wines grown in the country which formed the old province of Burgundy, France. Among the choicest red wines are Chambertin, Clos-Vougeot, Volnay, Pommard, Beaune; and Chablis is a well-known white wine. *See* Plates 90, 91.

**Burgundy Pitch,** a resinous substance prepared by soaking the natural exudation of the Norway spruce (*Abess excelsa*) in hot water, and used for chest plasters and in rheumatic complaints. It is brought chiefly from Finland, Austria, and Switzerland.

**Burlap,** a coarse canvas of hemp and jute, used for bags. A finer kind is made into curtains.

**Burrstones,** properly buhrstones. Blocks of hard silicate, from which millstones are cut. The best are quarried in the department of Seine-et-Marne, France. They are largely superseded in flour mills by iron rollers.

**Butt.** *See* **Leather.**

**Butter.** *See* **Dairy Products** (Plate 101).

**Butterine.** *See* **Margarine.**

**Butternut,** a North American walnut. *See* **Walnut.**

**Butter Tree,** several species of Bassia of the order Sapotaceæ bear seeds from which a kind of butter is made. *B. latifolia* is the Mahwa tree of India; its buds are eaten, and a spirit is distilled from them, and the seeds yield an oil for eating and burning. From the Phulwara (*B. butyracea*) a white oil is extracted, much prized as a medicine and an unguent. *B. longifolia* of Coromandel yields also a hard wood. *B. Parkii* produces the Galam or Shea butter of Africa. The butter nuts of South America are the fruits of trees of the Ternstrœmiaceæ order, natives of Guiana and Brazil, *Caryocar butyrosum*, *C. glabrum*, *C. amygdaliferum*, and *C. nuciferum*, some of which yield good timber.

**Butyric Ether,** an ether distilled from butyric acid and alcohol, with the addition of sulphuric acid. It has the flavour of pineapples, and is sold as pineapple oil for the purpose of flavouring sweets and drinks, and for the preparation of perfumes.

**Caballine Aloes,** the coarsest kind, or the refuse of Barbados aloes.

**Cable,** a large rope made of hemp used to tow vessels and let down the anchor. They are made of various thicknesses, up to 18 inches. Wire rope is often used instead, and for anchors the hemp cables have been superseded by chain cables.

**Cade Oil,** the empyreumatic oil made from *Juniperus oxycedrus* and other species.

**Cadmium,** a white ductile metal occurring in small quantities in zinc ores. It is an ingredient of easily fusible alloys, and is used in electro-plating. The sulphide, known as cadmium yellow, is a valuable colour for artists.

**Caffeine,** or theine, is the active principle present in tea, coffee, and kola nuts. It is manufactured on a large scale from refuse tea.

**Cajeput,** a tree of the order Myrtaceæ, *Melaleuca leucadendron*, which grows in Further India, the Moluccas, and Australia. A volatile oil is obtained from it by distillation, and is occasionally used in medicine.

**Calabar Beans,** the bean of Old Calabar (*Physostigma venenosum*), a climber allied to the scarlet runner. It is highly poisonous, but useful to oculists, as when placed on the eyeball it contracts the iris.

**Calamander,** a cabinet-wood of great beauty, the product of *Diospyrus hirsuta*, which grows in southern India and Ceylon. It is now rare. Calamander is perhaps a corruption of Coromandel.

**Calambac.** A name for aloes wood (*q.v.*).

**Calamine,** silicate of zinc, an important zinc ore. Another variety is carbonate of zinc. *See* **Zinc.**

**Calamus,** the sweet flag (*Acorus calamus*). The root yields an aromatic stimulant still prized in the East, and on that account the plant is cultivated in Ceylon and Burma. It is sometimes used to flavour beer, to scent toothpowder, and in the fabrication of gin and liqueurs.

**Calisaya Bark.** *See* **Cinchona.**

**Calomel,** sub-chloride of mercury, used as medicine.

**Calumba Root,** the roots of a climbing plant of East Africa (*Jateorhiza palmata*), yielding a tonic medicine.

**Camelina satwa,** a plant of the order Cruciferæ. This species, as well as *C. dentata*, is cultivated in Europe for the oil its seeds contain. The oil is used as salad oil, in soap manufacture, and in varnishes.

**Camels' Hair,** the hair from the neck, belly, and back of the camel. The last is the best. An adult Bactrian camel yields about 10 lbs. of hair. In Persian camel's-hair cloth, the hair forms the woof and cotton the warp. In France and England the hair is used in making hats and paint-brushes. China and Russia are the chief exporting countries. The United Kingdom receives about 5½ million lbs., worth £147,000.

**Camlet,** a textile made originally from camels' hair, but now from the hair of the Angora goat, and frequently of wool and thread or silk.

**Camomile,** plants belonging to the order of Compositæ. The camomile of druggists is the *Anthemis nobilis*, which yields an essential oil. It is cultivated chiefly in Germany and Belgium. *A. tinctoria* used to be employed as a yellow dye. *Matricaria chamomilla* is used in Germany for the same purposes as *A. nobilis*.

**Campeachy Wood.** *See* **Logwood.**

**Camphene,** or Camphilene. An artificial camphor obtained from turpentine. The name is also given to the series of oils isomeric with camphor, such as bergamot and lemon.

**Camphine,** spirit of turpentine obtained from *Pinus australis* of the Southern United States. Burning oils to which camphor has been added are sometimes sold as camphine.

**Camphor,** a solid essential oil obtained from certain species of laurel, the *Cinnamomum camphora* of China and Japan, and the *Camphora officinalis* of Formosa. The wood of the tree is cut into chips, and the camphor is driven out by steam. A somewhat different camphor is obtained in Borneo and Sumatra from *Dryobalanops aromatica* of the order Dipterocarpeæ, and is imported into China. Near Canton a third variety, called *ngai*, is obtained from *Blumea balsamifera* of the order Compositæ. The oil that drains from the camphor is also an article of commerce. Camphor is essential to the manufacture of smokeless powder. Japan exports (aver. 1900–2) 7,439,000 lbs. (£520,600), the greater part obtained from Formosa; and China exports 220,000 lbs. *See* Plates 170, 171.

**Camwood,** the wood of *Baphia nitida*, of the sub-order Cæsalpiniæ, which grows in West Africa. It yields a rich red dye. Barwood is a duller wood from the same tree.

**Canada Balsam.** *See* **Balsams.**

**Canada Pitch.** *See* **Pitch.**

**Cananga Oil.** *See* **Ylang-ylang.**

**Canary Seed,** the seed of *Phalaris canariensis*, a grass grown in Europe, Morocco, and California. It is used chiefly as a food for birds. Turkey supplies the greatest quantity, but the seeds of Spain and Portugal are the best.

**Candleberry,** the wax-tree, tallow-tree, or Bayberry of the United States (*Myrica cerifera*). The berries are covered with a greenish-white wax used for candles and soap. *M. cordifolia* is the wax shrub of Cape Colony.

**Candle-nut.** *See* **Bankul Oil.**

**Candles,** these are made of tallow, stearine, stearic acid, paraffin, spermaceti oil, and wax. Stearine candles include all those made from stearine and stearic acids obtained from tallow, palm oil (palmitic acid), and mixtures. Composite candles contain a considerable proportion of stearine obtained from coco-nut oil. Tallow candles are made by dipping the wicks in the melted grease; stearine and paraffin candles are cast in moulds; and wax candles are made by hand, strips of wax being wrapped round the wick, and the candle rolled on a marble slab to give it a cylindrical form. *See* also **Paraffin, Spermaceti Oil,** and **Ozokerite.**

**Canella Alba,** a tree of the order of Clusiaceæ, which grows in the West Indies. Its bark is the white cinnamon of commerce, used in Europe chiefly by apothecaries.

**Canes.** *See* **Bamboo, Rattan, Tobago,** and **Malacca Canes,** &c.

**Cannabis.** *See* **Hemp.**

**Cannel Coal,** a hard bituminous coal used in gas-making.

**Cantharides,** the blister beetles, often called Spanish flies (*Cantharis vesicatoria*), but these beetles, of which there are many species, are also exported from Russia, China, and Japan. Hungary supplies the greater part of the preparation.

**Canvas,** a coarse, unbleached fabric of flax and tow, of which sails are made, and cloth for pictures. The finest and strongest sailcloth is made from flax. Hempen and flaxen canvas are made in large quantities at Flers, in Orne, France, and cotton canvas at Beauvais and Paris.

**Caoutchouc.** *See* **India-rubber.**

**Capers,** the flower buds of the caper bush (*Capparis spinosa*), preserved in salt and vinegar. The bush grows in Italy and Sicily, but the best are produced in the South of France. One or two other species of *Capparis* yield good capers, and the berries of several other plants are often substituted.

**Capri.** This island, on the south side of the Gulf of Naples, gives its name to red and white wines, which are among the best grown in Italy.

**Capsicums,** the pods of a genus of Solanaceæ, which are generally cultivated in tropical and sub-tropical countries. They are also known by their Mexican name, *Chillies*. *Capsicum fastigiatum*, and *C. annuum* furnish most of the pods in trade, and from the latter is chiefly made the powder known as Cayenne pepper.

**Capucines,** the buds of *Tropæolum majus*, sold as capers.

**Carambola,** the fruit of *Averrhoa carambola*, an evergreen tree of the order Oxalidaceæ. It is used in the East Indies in pickles. This tree, as well as *A. Bilimbi*, which bears an acid fruit, have been introduced into the West Indies.

**Caramel,** a dark brown substance prepared by heating loaf sugar over a slow fire and used for colouring beer, whisky, vinegar, &c.

**Caranna,** a resin obtained from *Bursera acuminata*, of the order Terebinthaceæ, which is a native of Porto Rico and San Domingo.

**Carapa,** trees of the order of Meliaceæ, the nuts of which yield an oil used by the natives as a protection against insects, and in Europe in the manufacture of soap. *C. Guianensis* grows in Guiana and Brazil, and in the latter country the oil known as Andiroba oil is used for burning. The wood is called crab wood. The *C. Guineensis* grows in Senegal and Guinea, and yields Kundah oil.

**Caraway,** an umbelliferous plant (*Carum carvi*), cultivated in South and Central Europe, especially Germany and Holland, for its seeds. These are used as a flavouring material by confectioners, and the oil they contain is applied in perfumery and pharmacy and in the manufacture of liqueur (*Kümmel*).

**Carbolic Acid,** or Phenol, a white crystalline substance obtained from coal tar by distillation. It is used as an antiseptic, in the preparation of certain colouring matters, and in the manufacture of picric acid.

**Carborundum,** a silicium carbide used as a substitute for emery and other hard powders. It does not occur in nature, but about 3188 tons were manufactured in the United States in 1904 with the help of electricity generated by the Falls of Niagara. It is also used in the manufacture of steel and graphite.

**Cardamoms,** the capsules of several species of Zingiberaceæ. The seeds are a pungent spice, used in medicine and in confectionery. The best are the Malabar cardamoms, the pods of *Elettaria cardamomum*, next to which are the cardamoms of Ceylon, *E. major*. The *Amomum cardamomum* of Siam and the *A. maximum* of Java also yield spice. Ceylon exported (aver. 1902–4) 7794 cwts. (£56,975), and India (aver. 1901–3) 1700 cwts. (£12,400).

**Cardboard,** a board formed by pasting several layers of paper together. *See* also **Papier-mâché** and **Millboard.**

**Carmine,** the red colouring matter of cochineal. The colour is used in dyeing silk and wool, and being quite harmless, in confectionery. The secret of its manufacture being known in only a few factories, the price is high, and several imitations are made.

**Carnallite,** chloride of potassium and magnesium with an admixture of bromine and other chemicals. It occurs in Persia, Galicia, and especially at the Stassfurt mines in Germany. It owes its red colour and name to the presence of scales of iron oxide.

**Carnauba Wax.** This wax covers the leaves of a Brazilian palm, *Copernicia cerifera*. It is in composition nearly the same as beeswax, and is also used in making candles. In 1904 Brazil exported 39,268½ cwts., valued at £204,227.

**Carob,** the algaroba or locust-tree (*Ceratonia siliqua*), of the order Leguminosæ, sub-order Cæsalpiniaceæ, which grows in the countries bordering on the Mediterranean. The beans serve as a fodder for cattle, and yield on distillation a potable spirit. The residue contains gallic acid, and in conjunction with iron salts forms a black dye. The leaves are useful in tanning, and the seeds yield an excellent gum. The wood is hard and takes a good polish. The United Kingdom imports about 800,000 cwts. (£180,000), chiefly from Cyprus and Portugal.

**Carpets.** The chief European carpets are Kidderminster, which has no pile and shows a pattern on both sides; Brussels, in which the coloured threads required to form the pattern are raised by the Jacquard apparatus, and wires are inserted to raise the thread into loops; Velvet Pile or Wilton, in which the loops are cut by a sharp edge on the wires as these are withdrawn; Tapestry, in which the pattern is printed on the threads of the warp before weaving, and the wool lies on the surface, the back being formed of other material, frequently jute; Axminster, woven of chenille, which forms a pile without being cut. Very good carpets are also made of jute alone and strong ones of hair. The term five or six frame implies that there are five or six threads one above the other, those of any shade or colour being brought to the surface when they are required to form the pattern. Carpets are made in England and Scotland, at Tourcoing, Beauvais, and Aubusson in France, and at Schmiedeberg, Kottbus, Wurzen, and other towns in Germany. Eastern carpets are made by knotting tufts of woollen yarn on the warp threads. They are made in Asia Minor, chiefly at Ushak near Smyrna, in Persia, the finest being produced in Kurdistan, and in Kashmir, the Punjab, and several other parts of India.

**Carpincho,** the largest living rodent, the capybara (*Hydrochœrus capybara*), a native of South America. Several thousand skins are exported annually from Buenos Aires.

**Carrageen,** the Irish name for certain seaweeds, used for food, and now more particularly in invalid cookery. The true carrageen, or Irish moss, as it is commonly called, is the *Chondrus crispus*, of the order Florideæ. It is collected largely in the west of Ireland and on the American coast. The gelatine prepared from the seaweed is used by manufacturers of paper, felt, straw hats, &c. Ceylon moss, of similar properties, is another seaweed, *Sphærococcus lichenoides*, and several other species from India and Australia enter into commerce.

**Carrara Marble,** a white saccharoid limestone of Jurassic age, especially valuable to sculptors on account of its fine grain and uniform colour. It is quarried at Carrara, thirty miles from Leghorn. About 135,000 tons are sent out annually.

**Carthamin.** *See* **Safflower.**

**Carton-pierre.** *See* **Papier-mâché.**

**Cascara Sagrada,** the bark of *Rhamnus Purshiana*, a shrub of the buckthorn family, which grows in North-Western America, and yields a fluid extract much used as a purgative.

**Cascarilla,** an aromatic bark with tonic and astringent properties. It is the bark of the *Croton eluteria*, which grows in the Bahamas, where it is known as sweet-wood and seaside balsam.

**Case-hardening,** a process by which the surface of certain iron goods is converted into steel.

**Cased Skins,** whole skins of fur-bearing animals, not cut open at the belly.

**Cashew Nuts,** the fruits of *Anacardium occidentale*, which is cultivated in the West Indies, South America, Africa, and the East Indies. They contain an oil, which is used as a protection against ants and helps to make an indelible ink. Cashew gum exudes from the stem of the tree. The wood is also useful.

**Cashmere.** In Cashmere shawls are manufactured of the fine silky underwool of the Cashmere goat (*Capra hircus*, var. *laniger*). The plain shawls are woven in a rude loom, those with variegated patterns are worked with wooden needles. Imitation shawls are extensively manufactured in France, some entirely of the Cashmere or Tibet hair, and the material of fine wool called Cashmere is now manufactured in Europe.

**Cassava,** another name for manioc (*Manihot utilissima*). The starchy substance obtained from the tubers is called Brazilian arrowroot. The inspissated juice, called cassareep, is used in the manufacture of sauces.

**Cassia.** *See* **Cinnamon.**

**Castile Soap.** *See* **Soap.**

**Castoreum,** a secretion contained in two glands of the beaver, used by perfumers. The most esteemed comes from Russia, and fetches a higher price than the Canadian article.

**Castor Oil** (*Ricinus communis*), a small tree of the order Euphorbiaceæ, yields a mild purgative oil. The best oil is obtained by pressing the seeds without the application of heat, and is said to be *cold drawn*. The plant is a native of India, but is now cultivated in the Mediterranean countries, where it is called Palma Christi, and in America. The oil from larger varieties is also used as a lamp oil.

**Catechu.** *See* **Gambier.**

**Catgut,** strings of musical instruments are made from the intestines of sheep, not from catgut. The best come from Italy. Catgut is made in France from the intestines of horses, asses, and mules, and used in belts for driving small machines.

**Cats.** The domestic cat is reared in several countries of Europe for the sake of its fur. The best skins come from Holland, and in East Friesland, Schleswig-Holstein, Styria, Bavaria, Switzerland, &c., the rearing of cats is a regular occupation. The skins of wild cats are obtained in several European countries and in Siberia. The black Siberian skins are known as jennet. About 955,000 catskins come into the market annually.

**Cat's-Eye,** a rare mineral containing beryllium and alumina. The greyish-green stones found in Ceylon are highly valued gems.

**Cattle.** *See* **Meat** (Plate 65).

**Cavendish.** *See* **Tobacco.**

**Caviare,** the roe of various kinds of sturgeon, cleared from the connecting tissue and salted. The most esteemed is made from the roe of the sterlet (*Acipenser ruthemis*). The best caviare is made in Astrakhan, south Russia, and the Crimea, and is exported to the surrounding countries, little reaching Western Europe, as it does not keep well. Caviare is also made in Pillau, Magdeburg, and Hamburg from Elbe sturgeons, and inferior kinds from the roes of other fish. It is also prepared in Italy, Norway, and the United States.

**Cayenne Pepper.** *See* **Capsicums.**

**Cebadilla.** *See* **Sabadilla.**

**Cedar,** the cedar of Lebanon (*Cedrus Libani*) and the deodar of the Himalayas (*C. deodara*) yield excellent timber. The name cedar is also given to the wood of several other trees, of the Siberian stone pine (*Pinus cembra*), and the fir *Abies religiosa*, called the Red cedar of California. The Virginia cedar, the Bermuda cedar, used for lead pencils, and the Spanish cedar are junipers, and the cedar wood of Guiana is furnished by the *Icica altissima*, of the order of Amyridaceæ. Barbadoes cedar is *Juniperus barbadensis*, and the bastard Barbadoes cedar is *Cedrela odorata*; in Havana cigar boxes are made of it, and in France lead pencils. *See* Plates 158, 159.

**Celluloid,** a material formed of a mixture of gun cotton and oil, or sometimes camphor, thoroughly incorporated by hydraulic pressure. It is highly inflammable, and attempts have been made to render it less dangerous by mixing it with tungstate of soda or other non-combustible chemicals. Celluloid is largely used for making billiard balls, brush-backs, buttons, and other fancy articles.

**Cellulose,** the substance which lines young cells in plants, and in an impure state forms the harder parts. Natural cellulose in the form of cotton, flax, and wood is used in the manufacture of textiles, paper, gun-cotton, collodion, &c. A preparation of wood, consisting of almost pure cellulose, is known by this name in commerce.

**Cement.** The best known and most widely used is known as Portland cement, which is so called from its resemblance to Portland stone. It is composed of three parts of white chalk and one of river mud, or of hard limestone and clay or shale. It is hardly ever used pure, but is mixed with sand. Roman cement is prepared from septarian nodules which are calcined and ground. These are composed of carbonate of lime, silica, alumina, and protoxide of iron. Various cements are made from limestone, plaster of Paris, borax, iron filings, red and white lead, &c.

**Ceresine.** *See* **Ozokerite.**

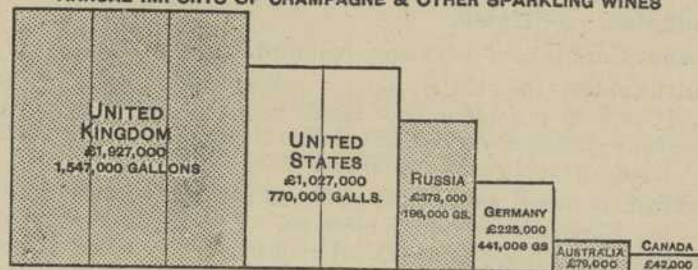
**Ceylon Moss.** *See* **Carrageen.**

**Chalcedony,** an imperfectly crystalline quartz, of which agate, carnelian, onyx, &c., are varieties. The name is more specially applied to whitish, bluish, or brownish stones with a wavy lustre. It is found in India, Siberia, Transylvania, and on the Rhine.

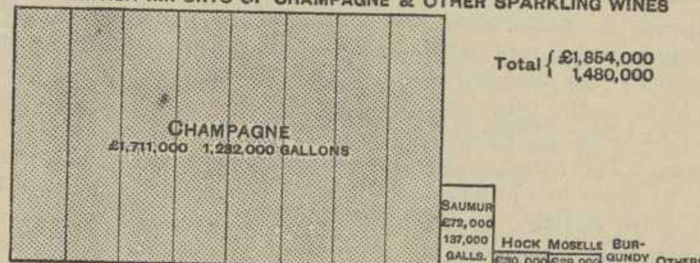
**Chalk,** a soft variety of limestone used when burned for the preparation of mortar. Mixed with vegetable colouring matter, it forms the crayons of artists. Vienna white is purified chalk. Black chalk is a kind of clay containing carbon. Red chalk is a red clay impregnated with oxide of iron. French chalk is soapstone.

**Chamois Leather,** originally made from chamois skins, and often called shammy leather. Now it is made from the skins of other animals, and is the same as buff leather. *See* **Buckskin.**

**Champagne.** Sparkling wines are made from the best wine carefully cleared and bottled with cane sugar to cause fermentation. When the bottle is uncorked the carbonic acid, released from pressure, rises to the surface in bubbles. Some inferior imitations are made by aerating the wine artificially with carbonic acid. It is said that sparkling wine was first made in the abbey of Hautvillers, near Epernay, in 1670. The manufacture of champagne, the best sparkling wine, is now carried on in the department of Marne—Rheims, Epernay, and Châlons being the chief centres. The production now averages about 9,840,000 gals. a year. Sparkling wines are also made at Saumur and Limoux, and, to a small extent, in Burgundy; also on the Rhine and Moselle, at Asti in north Italy, and in the United States, where 140,880 gals. were produced in 1900. *See* Plates 90, 91.




In 1902. The lower diagram shows the average for 1902–1904.




**Chanks,** shells of several species of *Turbinella*, obtained chiefly from the coasts of southern India and Ceylon, and sold in India as female ornaments.

**Charcoal.** Wood charcoal is made by burning wood in a heap or closed cylinders in which the supply of air is limited. Most of the hydrogen and oxygen and nitrogen contained in the wood are driven off, and the residue consists of a very large proportion of carbon. The greater the heat the larger is the percentage, but the total weight of the product also diminishes. Charcoal is used as a fuel, as a disinfectant, for electrodes, &c. Animal charcoal is obtained from bones and ivory by heating these substances in a closed vessel. Bone black and ivory black are well-known pigments.

**Charqui.** *See* **Jerked Beef.**

**Chaulmugra,** the seeds of the chaulmugra tree of India (*Gynocardia odorata*) are used in India as a medicine for skin diseases, and in Europe for consumption. The oil expressed from the seeds is applied externally.

**Chay Root,** the root of *Oldenlandia umbellata*, a herb of the order Cinchonaceæ. It is grown in Java and on the Coromandel coast, and yields a red dye.

**Cheese.** *See* **Dairy Produce** (Plate 101).

**Cherry,** the fruit of the cherry, a sub-genus of *Prunus*, is cultivated throughout Europe, and is an article of commerce, large quantities being exported from Germany. It is eaten as a dessert fruit, and is extensively used in the making of liqueurs—Kirschwasser, Maraschino, Noyau. An oil is obtained from the kernels, which may be used as a substitute for oil of almonds. The wood of the Bird Cherry (*P. padus*), and of the closely allied species *P. Virginiana*, is esteemed for cabinet work, and that of *P. mahaleb*, possessing an agreeable odour, is manufactured into pipe-stems, snuff-boxes, &c.

**Chesnut,** or Chestnut. The kernel of the chestnut (*Castanea vulgaris*) is an important article of food in southern Europe. The fruits of *C. Americana* and *C. argentea*, a Java species, are also eaten. Chestnuts are exported from Naples, Bordeaux, and Cadiz. The wood is used by coopers and the bark by tanners.

**Chianti,** a red Italian wine, grown on the Chianti hills, in the district of Siena. The best is produced at Brolio. *See* Plates 90, 91.

**Chica,** a dye-stuff obtained from the leaves of *Bignonia chica*, a climbing plant that grows on the banks of the Cassiquiare and Orinoco.

**Chick Pea,** a vetch (*Cicer arietinum*) growing in Mediterranean countries, and the East and Spanish America. The peas are eaten by man, and the stems and leaves are given to animals. Large quantities are exported from India under the name *gram*, which, however, includes other kinds of pulse. In south Germany chick peas are cultivated as a substitute for coffee.

**Chicle,** a gum obtained from the trunk of *Achras sapota* (sapodilla plum). About 1260 tons are collected annually in the southern states of Mexico, a great part of which is sent to the United States, where it is chewed.

**Chicory,** or Succory, a plant of the order Compositæ. The leaves are eaten as salad, and the roots are used as a substitute for coffee or to colour and flavour coffee, and for this purpose the plant is cultivated on the continent of Europe and in California. In 1904 the chicory imported into the United Kingdom, chiefly from Holland and Belgium, weighed 173,385 lbs., and was valued at £2374.

**Chillies.** *See* **Capsicums.**

**China Clay.** *See* **Kaolin.**

**China Grass.** *See* **Grass Cloth.**

**China Root.** *See* **Sarsaparilla.**

**Chinchilla,** a South American rodent with a soft grey fur (*Chinchilla lanigera*). It occurs on the Andes of Peru and Chile at a high elevation.

**Chinese Tallow.** *See* **Tallow Tree.**

**Chinese Wax,** a hard wax produced on the ash tree by the *pela* (*Coccus ceriferus*), belonging to the same genus as the lac insect. It is used in China for candles and for sizing paper and textiles, but is of little importance in Europe.

**Chinese White,** white oxide of zinc, used as a pigment.

**Chintz,** a highly glazed calico printed in several colours.

**Chip,** or Brazilian Grass, strips of the leaves of a dwarf palm (*Chamærops argentea*) used for the manufacture of hats and bonnets. Cuba exports a considerable quantity.

**Chirata,** or Chiretta, an intensely bitter plant indigenous in the north of India, where it is used as a tonic and febrifuge. In Europe it is used chiefly in the manufacture of bitters. The true chiretta or kreat is *Andrographis chiretta*, but other plants are used for the same purpose.

**Chittagong Wood,** the wood of *Chickrassia tabularis*, a tree of the Cedrelaceæ order, which is used in India by cabinet-makers. Other Indian woods are often called by this name.

**Chloral** (*Trichloralaldehyde*), prepared by the continued action of chlorine on alcohol. It is used in medicine as a sedative and hypnotic, and is prescribed in the forms of hydrate, chloralamide, &c.

**Chlorate of Potash.** *See* **Potash.**

**Chloride of Lime.** *See* **Bleaching Powder.**

**Chloroform,** the well-known anæsthetic, prepared by acting on certain alcohols with bleaching powder, or by the action of chlorine on marsh gas.

**Chocolate,** cocoa seeds ground into paste, sweetened and flavoured, generally with vanilla. It is used as a beverage and as a sweetmeat.

**Chow-chow,** Chinese name for mixed pickles, preserves, &c.

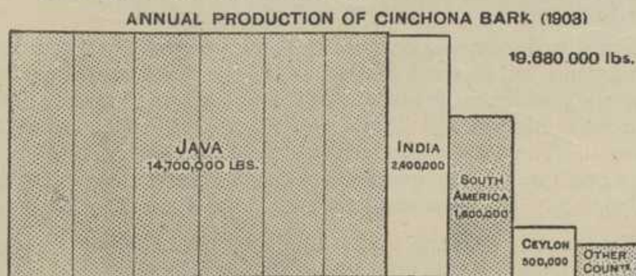
**Chromium.** This metal forms several combinations employed in arts and industries, the most important being a ferrochromium alloy, which renders armour-plates hard and tough. The most common ore is chrome ironstone, occurring in America, Hungary, Sweden, Turkey, &c. Chromate of lead is also mined, and is the chrome yellow of artists. Boiled with lime it yields a red dye for calico. Chromic oxide is extensively used for dyeing wall-papers instead of the dangerous arsenical green dyes, and chromic acid and bichromate of potash are used in bleaching and dyeing.

**Cider,** the fermented juice of apples, manufactured in parts of England, the north of France, America, and elsewhere. It contains 4 to 10 per cent. of pure alcohol.

**Cigars** and **Cigarettes.** *See* **Tobacco** (Plates 161 to 164.)

**Cinchona,** an important genus of trees of the order Rubiaceæ, yielding a valuable medicinal bark known as Peruvian and Jesuit's Bark, Quina (Indian name for bark), Quinquina, &c. There are several species, of which the best known are *C. officinalis* of Ecuador and Peru, *C. calisaya* of Peru and Bolivia, and *C. succirubra* of the western slope of Chimborazo. The tree has been introduced into India, Java, Queensland, Trinidad, and Jamaica. It prefers a moist climate and a mean temperature of 50° to 70° F., and therefore thrives in the Andes at a mean altitude of about 6000 feet. Five to six per cent. of alkaloids are extracted from good bark, half of which is quinine, a valuable febrifuge and tonic, prescribed usually in the form of the sulphate, which is popularly known as quinine. The hydrochlorate of quinine and the other alkaloids, cinchonidine and cinchonnie, are less frequently used. *See* also **Quinine.** *See* Plates 170, 171.

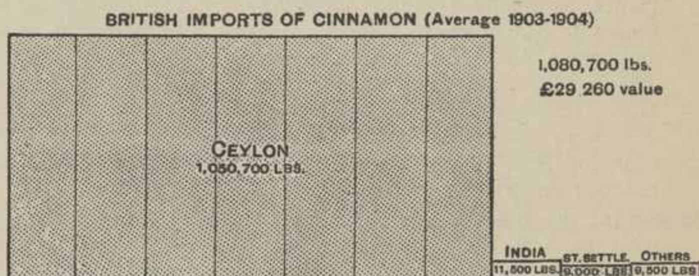
ANNUAL PRODUCTION OF CINCHONA BARK (1903)




**Cinnabar.** *See* **Mercury.**

**Cinnamon,** the aromatic bark of several species of the genus Cinnamomum of the order Lauraceæ. The best comes from Ceylon, and is obtained from *C. Zeylanicum*. The Chinese prefer the bark of *C. loureirii*, a native of Cochin-China and Japan. Oil of cinnamon, extracted from the leaves and waste bark, is commonly known in commerce as clove oil. Cassia is an inferior quality obtained from *Cinnamomum cassia* and other species in the East. Cassia "flowers," the unripe fruit, are also exported. *C. Zeylanicum* has been introduced into the West Indies. The bark is exported in the form of quills (strips of bark which roll up in drying) and chips. Ceylon is the chief source of true cinnamon; Java exports about 1,350,000 lbs. of cassia, and the Straits Settlements some 130,000 lbs. of cinnamon and cassia. *See* also **Canella.** *See* Plates 94, 95.

BRITISH IMPORTS OF CINNAMON (Average 1903-1904)




**Citron,** a fruit (*Citrus medica*) akin to the lemon. The most valuable part is the thick aromatic peel which is candied in Italy and exported. Citrons are also shipped from Greece. Oil of citron is used by perfumers. Citric acid occurs in limes, citrons, and other acid fruits. Chalk is added to the juice, forming citrate of lime, which is then decomposed by sulphuric acid. Citric acid is used by dyers, and the citrates of magnesia, ammonia, iron, and quinine are well-known medicines.



**Citronella Oil.** *See* **Grass Oil.**

**Civet,** a genus of cat-like carnivores (*Viverra*). There are several species inhabiting Africa, India, and the Eastern Archipelago. The strong perfume called civet is obtained from two perineal glands, and is exported chiefly from Abyssinia (*V. civetta*) and Java (*Viverricula Malacensis*).

**Clam,** bivalves of the genus Chama and allied varieties which are much esteemed as food in the United States. The giant clam, *Trida nacgigas*, found in East Indian waters, is so huge that its shells are often used for holy water stoups in Roman Catholic churches.

**Claret,** a name given in English to wines of the Bordelais, or Bordeaux district in France, the department of La Gironde. Chateau Lafitte, Margaux, and Chateau Latour are some of the best kinds. *See* Plates 90, 91.

**Clay.** The clays most used in industries are fire-clay and kaolin (*q.v.*); potters' clay, somewhat less pure; sculptors' clay, a fine potters' clay mixed with sand; and fireclay. A fire-resisting clay contains a large percentage of silica and alumina and small quantities of alkaline substances and oxide of iron. It occurs chiefly in the coal measures, and is made into bricks and slabs.

**Clinkers,** hard burnt bricks, manufactured chiefly in Holland. Also furnace slag, consisting principally of oxide of iron.

**Clocks.** *See* **Watches.**

**Cloves,** the flower-buds of *Caryophyllus aromaticus*, a tree of the order Myrtaceæ. The tree is a native of the Moluccas, and the cloves of Amboyna are still considered the best, but it is cultivated also in Java and Sumatra, Zanzibar, Mauritius, Réunion and the West Indies. The chief extract is oil of cloves, used as a spice; the tincture is added to certain drug mixtures. The fruit and stems have the same taste and odour, but of much less strength. Clove bark is a name applied to several barks of species of cinnamon and clove.

**Coal.** *See* Plates 130 to 133.

**Coal-Tar,** a black opaque liquid obtained when coal is distilled, and now usually in the process of gas manufacture. Aniline, alizarine, benzol, creasote, and naphthaline are extracted from it, and lamp black for printing ink, and it cements briquettes.

**Coatings,** broadcloths, made of wool, mixed materials, or worsted. Duffel is a coarse woollen coating with a thick nap.

**Cobalt,** a somewhat rare metal, generally found in combination with arsenic (spiess cobalt), or with arsenic and sulphur—cobalt glance. The ores are obtained chiefly from the Erzgebirge and Hungary, Norway, North America, and Chile. The oxide of cobalt is used as a blue pigment in porcelain painting; and smalt, a glass coloured with the oxide, is employed to give a blue colour to porcelain, paper, encaustic tiles, &c. It is the chief ingredient in Old Sèvres Blue, Turquoise Blue, &c., and with zinc produces the beautiful Rinman's Green.

**Coca,** the leaves of *Erythroxylon coca*, a shrub which grows in South America, are extensively consumed by the Indians as a stimulant. In Europe it is mixed with wine. The alkaloid cocaine is very valuable as a local anæsthetic.

**Cocco,** or Coco, or Eddoes, plants of the genus Colocasia, cultivated in tropical countries for their edible roots. *Colocasia antiquorum*, a native of India, has been introduced into the Mediterranean countries and America. Other species, as, for

instance, *C. esculenta*, are grown in the East. In the Oceanic Islands it is called *taro*.

**Cocculus Indicus,** a berry, the fruit of *Anomirta paniculata*, a climbing plant indigenous in the East Indies, where it is used to stupefy fish. The berries contain a poisonous principle, picrotoxine, and are imported into Europe to make insecticide powder.

**Cochineal,** a scarlet and crimson dyestuff. Cochineal is the bodies of the females of the *Coccus cacti*, which feed on cactus plants, especially *Opuntia coccinellifera*. The insects are an object of cultivation in Central America, and both the insect and plant have been introduced into the Canary Islands, Algeria, Java, and Australia. The imports into the British Isles average about 2600 cwts., most of it from the Canaries. About 70,000 insects go to a pound, and they yield 10 per cent. of pure dye. The introduction of aniline dyes has reduced the price of cochineal. *See* also **Carmine.**

**Coco-nut,** the fruit of the palm *Cocos nucifera*, now growing in most tropical lands, especially near the sea. The racemes bear five to fifteen nuts, and ten or twelve bunches grow on a tree, and the fruit is gathered four or five times in the year. The kernel contains more than 70 per cent. of a fixed oil, which is used as a lamp oil and unguent, and is imported into Europe in a dried state (*copra*) for the manufacture of stearine soap. The oil itself is also imported, and in 1904 Great Britain received 615,000 cwts., valued at £800,000. The sap of the tree yields palm wine and arrack, and is often boiled down into sugar (jaggery). The leaves are made into mats, screens, &c., and the fibre of the husk is much used for matting, &c. The double coco-nut, or coco-de-mer, grows on some of the Seychelles islands; it is the fruit of a different palm, the *Lodoïcea Seychellarum.*

**Cocoa.** *See* Plates 94 to 96.

**Cocoa Plum,** the pulpy fruit of the *Chrysobalanus Icaco*, a small tree of the Rosaceæ order, which grows in the West Indies. The fruit is eaten and also made into pickles. Other species growing in Africa yield edible fruits.

**Cocoon.** *See* **Silk** (Plate 121).

**Cocus Wood,** a dark brown wood from *Brya ebenus*, a West Indian tree. It is also known as West Indian and Jamaica ebony. The kokra or cocus wood of the East is the wood of *Lepidostachys Roxburghii.*

**Cod,** a genus of bony fishes, which includes the cod proper (*Gadus morrhua*), the haddock (*G. æglefinus*), whiting (*G. merlangus*), the whiting-trout (*G. luscus*), the power-cod (*G. minutus*), the coal fish (*G. virens*), and other species. The cod proper is particularly plentiful on the banks of Newfoundland, and is caught in large numbers on the Dogger Bank and off the coasts of Scotland and Norway. It is not only eaten fresh but is dried or salted, and large quantities are shipped to various countries. The oil extracted from the liver of the cod is exported from Newfoundland and Norway. The coarser brown oil is chiefly used by curriers, the light refined oil as a medicine. The roes are smoked and dried for food, and are used in France as bait for the sardine fishery, and are called *rogue*. *See* Plates 105 to 108.

**Codeine.** *See* **Opium.**

**Codilla.** *See* **Tow.**

**Cognac.** *See* **Brandy.**

**Cohune,** the palm *Aitalea cohune*, a native of Central America, yields the valuable cohune oil, which is said to be superior to coco-nut oil for burning.

**Coir,** the fibre from the husk of the coco-nut (*q.v.*).

**Coke,** a fuel obtained by heating coal in mounds, ovens, or gas retorts where the air is excluded. Tar-water and coal-gas are driven off and the residual coke is a hard, brittle, greyish substance, which burns with great heat and without smoke, and is therefore valuable in metallurgical factories and for other purposes. Coal yields about 70 per cent. by weight of coke. In purchasing coke by weight it is well to remember that it absorbs a considerable amount of moisture from the air.

**Cola Nut.** *See* **Kola.**

**Colchicum,** a plant of the order Liliaceæ, of which the only British variety is *C. autumnale*, the meadow saffron, sometimes called the autumn crocus. The whole plant has a very bitter taste, owing to the presence of the alkaloid colchicine. The root and seeds are used in the preparation of medicine for gout and rheumatism.

**Collodion,** gun-cotton dissolved in ether or a mixture of ether and alcohol. When exposed to the air it soon dries up into a thin film, and therefore it is applied to wounds, and in photography. The addition of Canada balsam and castor-oil imparts to it greater flexibility.

**Colocynth,** a purgative medicine, the dried and powdered pulp of the Colocynth gourd, bitter apple, or bitter cucumber (*Cucumis colocynthis*). Mogador, Spain, and Japan are the chief sources of supply.

**Colombo Root.** *See* **Calumba.**

**Colophony,** a name for the black resin obtained by the distillation of turpentine.

**Colours,** pigments ready prepared for use by artists, house-decorators, glass-workers, &c. The materials of which they are composed are ground and mixed with water or oil with an admixture of drying oil. The finest are used by painters, somewhat less fine for chromotype and chromolithography, and the coarser colours for house-painting. Powdered glass coloured with metallic oxides is employed in enamelling. Gold and silver is ground and mixed with gum for artistic decoration, and bronze powders of all colours are prepared, chiefly in Germany. In coarse paints, metallic combinations, especially white lead and zinc-white, are largely used because of their opaqueness, and also native earths, as oxide of iron, ochre, and umber, but vegetable substances and animal—lac, bone-black, &c.—are also ingredients.

**Colza Oil,** an oil obtained from rape, or coleseed, and other species of *Brassica*. Formerly it was largely burned in lamps, but petroleum, which is cheaper, has to a large extent taken its place. Colza is also a lubricating oil.

**Comb.** Combs are made of horn, ivory, tortoise-shell, bone, metal, indiarubber, and xylonite. The teeth are cut in bone, ivory, &c., with circular saws, and xylonite and indiarubber combs are moulded, the latter being afterwards vulcanised.

**Commanderia,** a sweet, dark Cyprian wine. The export is about 40,000 gals., worth £2200.

**Conch,** large shells, imported from the Bahamas chiefly, for the cutting of cameos and other ornaments—the pink conch (*Strombus gigas*), the black helmet shell (*C. Madagascariensis*), and others.

**Concrete,** a coarse mortar mixed up with broken stones or bricks, slag, gravel, &c., of which foundations and sometimes walls are built. Portland cement concrete hardens under water, and therefore is used in the construction of piers and breakwaters. Asphalt, cast-iron turnings, and pitch have been used for backing armour plates.

**Condurango Bark,** the bark of *Gonolobus condurango*, a plant of the family Asclepiadaceæ, which grows on the west slope of the Andes. It is used in dyeing.

**Connessi Bark,** the bark of *Wrightia antidysenterica*, used as a febrifuge in India. The seeds also are collected.

**Copaiva,** or Copaiba. The Copaïfera, trees of the family of Cæsalpiniaceæ, grow in tropical America and Africa, and yield a valuable balsam consisting chiefly of resin and volatile oil. The chief species are *C. Guianensis*, *C. officinalis*, *C. Langsdorfii*, and *C. coriaceæ*. The balsam, a pale to dark-brown liquid, is used in medicine, having a marked action on the mucous membrane. *C. bracteata* yields the beautiful red amaranth wood of the West Indies.

**Copal,** a general term for resins derived from trees of several kinds. *Guibourtia copalifera* supplies the resin of Sierra Leone, and *Trachylobium Mozambicense* the copal of Zanzibar. New Zealand has the copal of the Kauri pine, *Dammara Australis*, and the East Indies *Vateria Indica*. The South American copals are furnished by various Hymenæas and Trachylobiums, especially *Hymenæa Courbaril*. The harder kinds, such as those of Zanzibar and Mozambique, are the more valuable. *See* also **Anime.** *See* Plate 165.

**Copalchi Bark,** an aromatic bark obtained from *Croton niveus*, a shrub indigenous in Central America. It is weaker than cascarilla bark, and is used in Mexico as a substitute for quinine, for it contains a very small proportion of a bitter alkaloid somewhat resembling quinine.

**Copper.** *See* Plate 134.

**Copperas,** sulphate of iron in green crystals, also called green vitriol. It is used in dyeing and tanning and in the manufacture of ink.

**Copra,** the dried kernel of the coco-nut from which oil is expressed.

**Coprolites,** the fossil excrement of extinct animals, containing a large proportion of phosphate of lime, and therefore valuable as manure.

**Coquilla Nuts,** the fruits of a Brazilian palm (*Attalea funifera*), made by turners into buttons and other small articles.

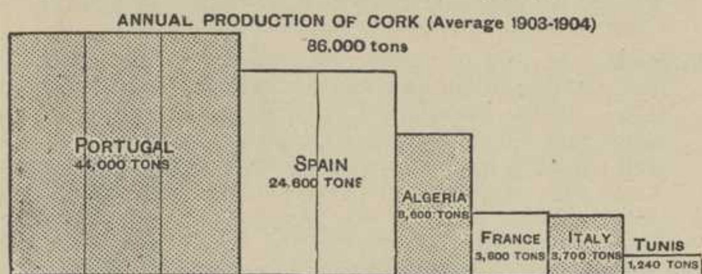
**Coral,** the hard limy support of coral polyps manufactured into ornaments. The coral mostly used is the red coral (*Corallium rubrum*), which is fished up off the coasts of Naples, Sicily, Sardinia, Algeria and Tunis, and other parts of the Mediterranean. The most highly prized is the light pink coral. About 542,000 lbs. are obtained yearly off the Italian coasts (value, £76,600). Italy has almost a monopoly of the manufacture.

**Coralline,** a red colouring matter produced by the action of oxalic acid on phenol in the presence of sulphuric acid.

**Cordite,** a smokeless explosive used for cartridges. It is a mixture of nitro-glycerine, gun-cotton, and vaseline.

**Coriander,** the seeds of *Coriandrum sativum*, a plant of the Umbelliferæ order, which is found in Mediterranean lands and Asia, and is cultivated in Germany and England. They are sometimes used in medicine, but more largely as a spice, in liqueurs and confectionery.

**Cork,** the light inner bark of the cork oak, *Quercus suber*. The outer bark, virgin cork, is stripped off and used for net floats, boat-fenders, and other rough purposes, and also for the manufacture of Spanish Black, a charcoal used by painters. Ten or twelve years after the stripping the lighter valuable cork is ready for the market. The tree grows in the countries bordering the Mediterranean, from Greece to Morocco, and as far north as lat. 45° in the neighbourhood of Bordeaux. The chief consuming countries are France, Great Britain, Germany, Russia, and the United States. Italy consumes the greater part of its own production. *See* Plates 158, 159.




**Cornel,** or Cornelian cherry. The small tree *Cornus mas* is a native of middle and southern Europe. Its fruit, a small plum, is used in Turkey in making sherbet, and its wood is valued by turners and instrument makers.

**Corn-flour,** finely ground flour of maize.

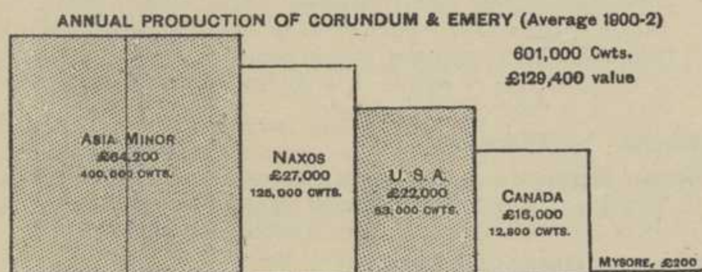
**Coromandel Wood.** *See* **Calamander Wood.**

**Corozo Nuts.** *See* **Vegetable Ivory.**

**Corrosive Sublimate,** sub-chloride of mercury (*q.v.*).

**Corticine,** a floor-cloth made of powdered cork and other material. *See* **Linoleum.**

**Corundum,** alumina, or aluminium oxide, a mineral only less hard than diamond. The clear varieties are sapphire, ruby, oriental amethyst or oriental topaz, according to their colour. Rough corundum mined in India, Ceylon, and North America, is used for cutting stones, and a softer form, used in polishing, is the well-known emery found in abundance near Smyrna, in Naxos, and in the United States.




**Costus,** the root of *Aplotaxis auriculata*, often erroneously ascribed to *Costus Arabicus* and other plants. The root grows in Kashmir, and is used as incense in perfumery, &c.

**Coto Bark,** a bark exported from Bolivia, the origin of which is unknown. It is reddish brown in colour, and smells somewhat like cardamom and cajeput oil. It is used as a medicine. Para coto bark has a rather different chemical composition.

**Cotton.** The cotton plant belongs to the family of Malvaceæ, and grows in tropical and sub-tropical regions, flourishing up to lat. 37°, though it is cultivated successfully in a few countries still further north, as in Russian Central Asia, where it is grown in Khiva up to 43°. The cotton plant demands a mean temperature of from 66° to 77°. Very high temperatures and frost are alike injurious to it. It also requires a fair amount of moisture, both in the atmosphere and the soil, but not an excess. Sandy soils allow the rain to soak through them too quickly, and clayey soils are too impervious. The best kind is a deep loam. Sometimes the cotton plant attains to the dimensions of a tree, especially *Gossypium arboreum*, which reaches 20 feet, and it will live for forty years; it is, however, almost always cultivated as an annual or biennial, and therefore takes the form of a bush. There are many varieties, some of which are probably not distinct species. To *G. Barbadense* belongs the sea island cotton of the United States, which is cultivated on the islands and low coasts of South Carolina, Georgia, and Florida, and also the cotton of Egypt. The upland cottons of the States have originated from *G. herbaceum* and *G. hirsutum*. In South America is found the *G. Peruvianum* of Peru and Brazil, perhaps only a variety of *G. Barbadense*. The short-stapled cottons of India are derived chiefly from *G. neglectum*, *G. herbaceum*, and *G. Wrightianum*. Other species, or varieties, are indigenous in Central Asia, Africa, &c., but in general they yield an inferior fibre. Slight differences of soil and climate produce variations in the character of the cotton, so that not fewer than one hundred and thirty kinds are counted in the United States alone. The flowers vary in colour according to the species, being yellow, pink, brownish red, or purple. The pod has five cells in which are seeds covered with fibres. These act the part of thistle down in carrying the seeds to a distance, and are the cotton of commerce. They are composed of carbon, hydrogen, and oxygen, and are almost pure cellulose. They differ in length and diameter, those of sea island cotton being the longest and finest. The fibres of this cotton vary in length from 1.9 to 2.2 inches, and have an average diameter of $\frac{1}{1262}$ inch. Indian cotton is short and brittle, the best, Bengal cotton, having a staple not exceeding 1.3 inches and a diameter of $\frac{1}{1365}$ inch, while Madras cotton has very short straight fibres. Next to sea island, Egyptian cotton is the best, while Orleans cotton is very regular in staple. Though sea island cotton commands the highest price, stronger fibre of a medium staple is most in demand. When the seeds and fibre have been removed from the pods, the fibre is stripped from the seeds by machines called gins—the roller gin, Macarthy's gin, the saw gin of Eli Whitney, and others. Some short fibres still cling to the seeds, and are removed by linting machines and made into wadding. The cotton is compressed by steam presses into bales of various weights, the American bale of upland cotton weighing on an average 515 lbs.; the Egyptian bale 700 lbs.; the Indian about 400 lbs.; and the Brazilian 175 to 220 lbs. The American cylindrical bale, recently introduced, contains 420 to 430 lbs. Of late years the consumption of cotton in the factories of the world has been 13½ to 14 million bales of 500 lbs. each, and the supply has not tended to increase in as great a ratio as the consumption. There has been a marked development of cotton spinning in the southern United States, and in the East the manufacture is increasing. There is good reason to hope that Africa may in time contribute largely to keep up the supply, and in the West Indies, where cotton was formerly grown to a much larger extent than at present, new plantations have been laid out. South America also could raise a much larger quantity, and Queensland and the northern territory of South Australia possess lands and a climate suitable for the plant. Cotton better adapted for European manufacture might be raised in India with care in the selection of seed.

Great Britain is still the leading manufacturing country, owning nearly half the spindles of the world. The United States now works up a larger quantity of the raw material, but its goods are of inferior quality. A large part of the yarns from the spinning mills is woven at once into cloth. For some fancy cloths the yarn must be bleached and dyed beforehand. Calicoes are printed after they are woven. Another large part of the yarn is twisted into sewing cotton, and for the manufacture of lace and silk imitations the yarn is "gassed," that is, passed rapidly several times through the flame of a Bunsen burner, by which all the light loose fibres are burned off. Mercerization is a process of treating the cotton fibre. The fibre is steeped in caustic soda, which is afterwards removed by dilute sulphuric acid. The effect is to expand the fibres and increase their weight and strength, and to give the natural twist a regular spiral form. Mercerized cotton also possesses a greater affinity for certain dyes and mordants.

Besides the fibre, the seeds are a valuable product of the cotton plant. The oil expressed from them is used for making salad oil, butter, lard, soap, and phonograph cylinders. In southern Europe it is largely used instead of olive oil, or as an adulterant to the latter. The meal from the seeds and the hulls are an excellent food for cattle, and the latter furnish material for an excellent grade of paper. The fibre of the stalks has been made into sacking for cotton bales, and might also be manufactured into rugs and carpets. *See* also Plates 109 to 112.

**Cotton Waste,** the refuse of the mills, strippings of the carding machines, &c., which amount to 15 or 20 per cent. of the material worked. This refuse is used in the manufacture of counterpanes, common carpets, wadding, wicks, twine, &c.

**Cottonwood,** the North American poplar (*Populus Canadensis*), particularly abundant on the Upper Mississippi and Missouri, which yields good timber.

**Cow-Hair.** *See* **Hair.**

**Cow-Hides.** *See* **Hides.**

**Cowry,** a large genus of Gasteropods. The money cowry (*C. moneta*) is used in many parts of southern Asia and Africa as a medium of exchange. The shells are also made into necklaces and other ornaments.

**Crape,** a thin gauze of silk tightly twisted. The chief kinds are English, French, and Chinese Crape. In soft crape the torsion is less than in the other kind. English crape is very solid, and has regular furrows produced by a roller with projecting lines. In Eastern crape the weft is composed of alternate threads twisted in opposite directions, and the material is made crisp by dipping it alternately in hot and cold water.

**Cream of Tartar,** bitartrate of potash; prepared from impure bitartrate, or argol (*q.v.*).

**Creasote,** an oily liquid obtained from wood or coal-tar. The more common article of commerce is made from the latter, and is used to preserve railway sleepers and other logs from decay. Wood creasote has a different composition. Creasote is also used in small quantities as a medicine.

**Cretonne,** a thick, strong twilled cotton fabric, printed in colours, and used for curtains and furniture covers. It is rarely calen-

dered or glazed. The weft of the inferior qualities is composed of cotton waste.

**Croton,** a genus of plants of the natural order Euphorbiaceæ. The seeds were formerly administered as a drastic purgative, but now the oil expressed from them is generally used for internal and external application. Besides the species yielding cascarilla and copalchi bark, several others, as *C. gratissimus* of the Cape, *C. organifolium* and *C. balsamifera* of the West Indies, and *C. malambro* of South America, yield perfumes, cosmetics, and incense.

**Crown Glass.** *See* **Glass.**

**Crucibles,** pots in which minerals and metals are fused. They are made of fire-clay, graphite, iron, or platinum, and, for certain operations, of silver.

**Cryolite,** fluoride of aluminium and sodium, a rare mineral, found in large quantities only near Ivigtut in southern Greenland, and occurring sparingly in Colorado. It is a cheap source of alum and soda, carbonate and bicarbonate, and caustic soda, and is sometimes employed as a source of aluminium, but is now often mixed with bauxite simply as a flux. About 145,000 cubic feet of cryolite are exported annually from Greenland.

**Cubebs,** the dried berries of *Piper cubeba*, a native of Java, Sumatra, and southern Borneo, and also cultivated in the Antilles. The powdered berries are used as a stomachic, as well as the volatile oil they contain, which also enters into the composition of some throat lozenges.

**Cudbear,** a brownish-red powder made from archil paste, formerly extensively used by the dyer, in conjunction with logwood, fustic, and other dyestuffs, to produce delicate shades of purple.

**Culilawan Bark,** the bark of *Cinnamomum culilawan*, which grows in the Moluccas. It has an odour of cloves and nutmegs, and its oil is used in perfuming soap.

**Culm,** an impure anthracite. When obtained from the pits in a crumbling condition, it is often mixed with clay and formed into briquettes.

**Cummin,** or Cumin (*Cuminum cyminum*), a plant of the Umbelliferæ order, common in Egypt, southern Europe, and India. The seeds are used by veterinary surgeons, and to flavour bread, cheese, &c.

**Cumquat,** the fruit of a small orange (*Citrus Japonica*) which is candied in China and exported in jars.

**Cuprea Bark,** the bark of *Rennijia pedunculata*, and perhaps also of *R. Purdieana,* trees of South America allied to the cinchona. The bark contains quinine.

**Curaçoa,** a liqueur, named after the West Indian island, but now made in Amsterdam by distillation from the dried peel of small unripe oranges.

**Currants,** the name is given not only to the ordinary garden currant (*Ribes*) but also to a small seedless fruit of the vine, cultivated chiefly in Greece and the Ionian islands, being a corruption of the name of the town, Corinth. Currants are exported in a dried state. The exports from Greece are about 110,000 tons annually, worth £1,274,000.

AVERAGE ANNUAL IMPORT OF CURRANTS INTO UNITED KINGDOM
1,146,000 cwts. £994,000 value (1902-4)

GREECE
1,126,000 CWTS. OR 98.2 %
HOLLAND
17,000 C. OR 1.5 %
OTHERS
3,000

**Custard Apple,** the fruit of several species of *Anona*, which grow in the tropics, and are very delicious. Among them are the Cherimoya (*A. cherimolia*) and the common custard apple or sweet-sop (*A. squamosa* or *reticulata*). The sour-sop (*A. muricata*), the North American pappaw (*Asimina trilobata*), and the alligator apple of the West Indies (*A. palustris*) are also included under this name.

**Cutch,** the juice of *Acacia catechu* and *A. suma*, thickened by boiling. It is a very permanent colouring material, and is used in dyeing black, brown, drab, &c. Areca palm nuts yield an extract somewhat resembling true cutch, but of inferior quality. The United Kingdom imports about 5000 tons (£128,000), chiefly from Burma and the Straits Settlements.

**Cutlery.** Under this name are included knives, forks, scissors, razors, surgical instruments, &c. In England, Sheffield is the great centre of manufacture. Other towns where these articles are manufactured are Nogent, Thiers, and Châtellerault in France, Namur in Belgium, Solingen in Rhenish Prussia, Steyer in Austria, Eskiltuna in Sweden, and New Britain in the United States.

**Cuttlefish.** This cuttlefish (*Sepia officinalis*) is caught for the sake of its spoon-shaped dorsal bone, which is ground up into tooth powder, and a hollow gland containing a dark-brown liquid from which the pigment sepia is prepared.

**Damask,** a material generally of one colour, in which the design is produced by a difference in the finish of the threads of the warp and the weft. Damasks are made of silk, woollen, and cotton, or from a mixture of two of these materials. They are used for dresses, furniture covers, and table-linen. They originated in the city of Damascus, whence their name, but are now manufactured chiefly in Great Britain, France, and Germany.

**Damiana,** the leaves of *Turnera aphrodisaica* and *T. diffusa*, which are used in Mexico as a nerve stimulant and infused like tea. Of late they have found their way into Europe.

**Dammar,** the Dammar pines are conifers of the Araucariæ family, natives of the East and Australasia. The best known is the *Agathis orientalis* of the Eastern Archipelago. The Kauri pine of Australia and New Zealand is *A. Australis*, and New Caledonia has the *Dammara ovata* with similar properties. These trees exude a resin valuable in the preparation of varnishes. About 120,000 cwts. (£397,000) of Kauri gum are imported into Great Britain, most of it from N. S. Wales and New Zealand. Black Dammar is the product of species of *Canarium*, and the resin of other trees sometimes bear the name.

**Dari.** *See* **Durra.**

**Date,** the most important date palm is *Phœnix dactylifera*, which grows in North Africa, south-western Asia, and south Europe. It requires an annual temperature of 70°–73° F., and thrives best between lat. 19° and 35°. The best dates come from Tafilet in Morocco. Palm wine is made from the sap, and the buds are eaten as a vegetable. The seeds are roasted and used as a substitute for coffee, and oil is extracted from them. The leaf stalks are made into basket work, and the leaves themselves into mats and bags. The toddy palm of India, *P. sylvestris*, is very similar and may be merely a variety. It yields arrack and sugar (*jaggery*). Other species grow in South Africa and Sierra Leone. The average imports of dates into the United Kingdom are about 394,000 cwts., valued at £245,700, the greater part from Turkey in Asia. *See* Plates 98, 99.

**Date Plums,** the edible fruits of various species of Ebenaceæ, which also furnish ebony, ironwood, and other valuable timbers. The common date plum resembles a black cherry, and is the fruit of *Diospyros lotus*, which grows in Transcaucasia and North Africa, and as a cultivated tree in southern Europe. *D. kaki* is the date plum of Japan. The American date plum, *D. Virginiana*, is there called persimmon.

**Datura.** *See* **Thornapple.**

**Deccan Hemp,** the fibre of *Hibiscus cannabinus*, a native of India. Though not so strong and durable as true hemp, it makes good ropes and coarse fabrics. Also called Indian Hemp.

**Deer.** *See* **Horns** and **Hides.**

**Deer-tongue Leaves,** the leaves of *Liatris odoratissima*, a native of Carolina, which are often used as a substitute for tonka beans in flavouring tobacco.

**Deodar.** *See* **Cedar.**

**Dextrine,** starch mixed with dilute acids and heated to about 200°, becomes soluble in hot and cold water, and loses its gelatinous character. It is then called dextrine or British gum, and is used to stiffen textiles, gum envelopes, &c.

**Diamonds,** crystallised carbon, generally of an octohedral form. Diamonds are found in clay and gravel deposits, and during the past thirty years large numbers have been obtained in South Africa. India, formerly famous for diamonds, now yields very few. Brazil and British Guiana also furnish stones. The value of the stones depends on their brilliancy and colour, the yellow and other tinted stones being less valuable than the pure white. South African diamonds fetch 30 to 48 shillings per carat (151½ carats = 1 oz. Troy). The Russian Orloff diamond weighs 193 carats, and the Koh-i-nur is noted for its brilliancy and purity. The largest diamond known is the Cullinan diamond, discovered in 1905 at the Premier mine, Transvaal. When uncut it weighed 3025¾ carats, or more than 20 oz., and it is of very fine quality. Bort occurs in rounded forms, and has a confused crystalline structure. Carbonado, or black diamond, is as hard or harder than the other kinds, and is much used for industrial purposes, and the price has risen of late years to as high as that of the white diamond. It is used for facing rock-drills and cutting wheels and for wire-drawing. Brazil is the chief source of this variety, and the price has risen to about 45 shillings per carat. The largest black diamond found in 1895 weighed 3150 carats. *See* Plates 149 to 151.

**Dikamali,** a fragrant gum resin obtained in India from *Gardenia lucida*, and used medicinally.

**Dill,** an annual, or biennial, plant which grows wild around the Mediterranean (*Anethum graveolens*). The seeds are used as a spice and in medicine. The *A. sowa* of Bengal has similar properties.

**Dimity,** a stout figured cotton fabric with raised stripes, on which a pattern is sometimes printed.

**Divi-divi,** the pods of *Cæsalpinia coriaria,* a leguminous tree of the West Indies and South America, which are used in tanning. Venezuela is the chief exporting country. The tree has been introduced into India.

**Doeskin.** *See* **Buckskin.** The name is also applied to a twill of cotton and wool used for clothes.

**Dog-fish.** The popular name for several species of the shark sub-order of Elasmobranchs. The skins of the spotted dog-fishes (*Scyllium canicula* and *stellare*) are used for polishing wood and ivory, and, after the spines have been removed, in covering instrument cases and other small boxes. The livers of the *Acanthias,* which belongs to a different family, yield oil.

**Dogs.** There is a considerable trade carried on in dogs of various breeds, and their skins are an article of commerce. Those of large dogs are made into leather for shoes and gloves, and those of small animals into white leather for gloves. In China dogs are reared for their skins, which are used as mats, coats, &c.

**Dogwood,** or Dogberry, the name of several trees and shrubs of the genus Cornus. The European dogwood (*C. sanguinea*) yields an oil resembling olive oil, and the charcoal prepared from the wood is the best for gunpowder. The wood of *Rhamnus frangula* is also used by gunpowder makers and called dogberry. The bark is employed in medicine, and furnishes a yellow dye. *C. sanguinea* and *C. Florida* of North America have woods valuable to turners and inlayers.

**Dowlas,** a coarse unbleached linen used for pillow-cases, sheets, aprons, &c.

**Down.** *See* **Feathers.**

**Dragon's Blood,** a deep-red or reddish-brown resinous substance obtained from a variety of trees. An East Indian palm, *Calamus draco,* is the most important. It grows most freely on the east coast of Sumatra. The *Dracæna draco* is the Dragon tree of the Canary Islands. Red sandalwood (*Pterocarpus santalinus*) is another East Indian source, and *P. draco* grows in the West Indies. Dragon's blood is an ingredient of varnishes, stains, and dentifrices.

**Drill,** a linen twill used for light trousers.

**Drugget,** a coarse woven and felted woollen material used for covering carpets. Also a stout dress fabric with a linen warp and a worsted weft.

**Duck,** a fine, highly-glazed linen canvas, used for sails, sacking, trousers, &c.

**Dugong,** a species of siren, inhabiting the Indian Ocean and the Eastern Archipelago as far west as the Philippines. Another species, *Halicore tabernaculi,* is confined to the Red Sea and East African coast, and the third, *H. Australis,* is found in the waters of Eastern and Northern Australia. The oil is an article of commerce; it is said to have all the medicinal properties of cod-liver oil.

**Durma Mats,** the fibre of *Amphidonax karka,* a kind of reed, is woven in India into mats, thus named.

**Durra,** a genus of grasses, known also as Indian millet. Common durra (*Sorghum vulgare*) is extensively cultivated in India, where it is called great millet and *jawar,* and in Africa as a cereal. *S. Caffrorum* (Kaffir corn) is grown in South Africa, by Europeans, chiefly for cattle fodder. *S. saccharatum* is a source of sugar in the United States. *See* Plate 74.

**Dutch Metal,** an alloy of copper and zinc beaten out into leaves and used instead of gold in rough work.

**Dutch Rushes,** stems of the horsetail (*Equisetum hiemale*) are exported from Holland. They are used in polishing metal, marble, wood, &c.

**Dyewoods.** *See* **Logwood, Brazil Wood, Sappan, Camwood, Fustic,** &c. (Plate 176).

**Dynamite,** nitro-glycerine kneaded into kieselguhr, a siliceous earth composed of the remains of diatoms. This earth is obtained in Aberdeenshire, Germany, and Norway. Generally three parts of nitro-glycerine are mixed with one of kieselguhr. The dynamite is made up into cartridges and used for explosions in mines, &c. It can only be exploded by detonation, and a capsule of fulminate of mercury is employed for the purpose. There are other forms of dynamite, such as lithofracteur, and a very effective gelatinous dynamite, prepared by soaking less than 7 or 8 per cent. of gun-cotton in nitric acid, whereby a syrup is produced which, with about 8 per cent. of lint, forms a powdery substance. This dynamite holds the nitro-glycerine better in water or under pressure.

**Eaglewood.** *See* **Lign Aloes.**

**Ear-shell** (*Haliotis*) is a genus of gasteropods, of which the shells have a beautiful mother-of-pearl lustre. The Venus' Ear of Italy is particularly beautiful, and is used in inlaying.

**Earth Nuts.** *See* **Ground Nuts.**

**Earthenware.** *See* **Pottery.**

**Ebonite.** *See* **Vulcanite.**

**Ebony,** a heavy, hard black wood, the heart-wood of several species of Diospyros. The best ebony is furnished by *D. ebenus* of India and Ceylon. *D. hirsuta* is Calamander wood, and *D. lotus* is green ebony. The persimmon of Texas (*D. Texana*) yields a small quantity. Jacaranda, Dalbergia, Brya, &c., also yield woods known as ebony.

**Eddoes.** *See* **Cocco.**

**Eggs.** *See* **Dairy Produce** (Plate 101).

**Eider.** Eider down is the breast down of the common eider (*Somateria mollissima*), and the King's eider (*S. spectabilis*). It is collected from the nests in Norway, Iceland, Spitzbergen, Greenland, and Newfoundland (Plates 122, 123).

**Ejoo,** or Gomuti, a fibre obtained from *Arenga saccharifera,* the sugar palm of the Eastern Archipelago. It is very durable, and is made into cables, &c.

**Elaterium,** a powerful purgative obtained from the fruit of the squirting cucumber (*Ecbalium elaterium*), which grows in Southern Europe.

**Elemi,** a medicinal resin obtained in the Philippines from *Canarium album* or *commune.* The resins of various kinds of *Icica,* used as substitutes, are exported from Guiana and Brazil.

**Elm.** The wood of the English elm (*Ulmus campestris*) is strong and close, little liable to split, and resists the action of water. Keels of ships, naves and spokes of wheels, &c., are therefore made of it. The Wahoo (*U. alala*) of the southern United States has a fine-grained compact wood, and the wood of the slippery elm (*U. fulva*) is fairly good. *U. chinensis* bears galls used in tanning and dyeing. The name Spanish elm is given to the *Cordia gerascanthus* of the West Indies, which yields the Bois de Chypre, and to *Hamelia ventricosa,* from which Prince's Wood is obtained.

**Embden Groats,** crushed groats often made into gruel.

**Emerald,** a crystallised silicate of beryllium, differing from beryl and aquamarine only in its dark green colour. The finest stones have been found in Colombia, and on the Upper Orinoco several valuable stones have been obtained. Siberia and New South Wales also produce emeralds. Those of Salzburg and other parts of Europe are inferior. Oriental emeralds are green corundum.

**Emery.** *See* **Corundum.**

**Ergot.** The ergot of rye used in medicine are the ovaries in a diseased condition produced by a fungus, *Claviceps purpurea.* The active principle, ergotine, is also a commercial article.

**Erigeron.** From *Erigeron Canadense,* the fleabane of North America, a medicinal oil is extracted.

**Ermine,** or Stoat (*Putorius erminea*), a small animal of the marten family. In winter the fur turns white, and is then used for collars, coat-linings, &c. Norway, Siberia, and North America are the producing countries (Plates 122, 123).

**Esparto,** a grass (*Stipa* or *Macrochloa tenacissima*) which grows in Spain and along the coast of Africa in Algeria, Tunis, and Tripoli. The greater part is sent to England for the manufacture of paper. In North Africa it is called Alfa or Halfa. *Lygeum spartum* is sold with it and yields a similar fibre.

ESPARTO FIBRE—UNITED KINGDOM IMPORTS, 1904
200,000 tons—£748,000 value

| | | | |
|---|---|---|---|
| ALGERIA 82,700 TONS, OR 41.8% | TRIPOLI 46,450 TONS. 23.2% | SPAIN 45,200 TONS, 22.6% | TUNIS 25,800 TONS OR 12.9% |

**Ether,** a colourless, transparent, and very volatile liquid formed by the action of sulphuric acid on alcohol. It is very inflammable, and owing to its rapid evaporation, lowers the temperature of any object with which it is in contact. It is a good solvent for oils and fats and some other matters, and the compound ethers—acetic ether, formic ether, &c.—are very fragrant.

**Eucalyptus,** a genus of Myrtaceæ, which yield valuable resins, timber, and oil. The trees are some of the most majestic of Australia and Tasmania, and attain an immense height. From the leaves of *E. globulus* (blue gum) and other species a volatile oil is distilled, which is used in soap manufacture, to dilute perfumes, and in varnishes. It is well known also in pharmacy. *E. resinifera* yields the "mahogany" of Australia; *E. marginata,* the jarrah wood now imported into Europe for street-paving; and other species furnish useful wood for construction and cabinet work. Mallet bark, from *E. occidentalis,* has lately come into use for tanning, and the tree has been largely planted in Natal.

**Euphorbium,** an extremely pungent juice obtained from various species of Euphorbia in the Canaries, Morocco, Arabia, and the East Indies. It is now used almost exclusively in veterinary medicine.

**Extract of Meat,** a concentrated solution of beef made in large quantities in South America, especially in Uruguay (Fray Bentos) and Argentina, where cattle are numerous. Uruguay exports about 1,385,000 lbs., worth £264,000.

**Fans.** In Europe the industry of fan-making is especially flourishing in France. Paper, fine parchment, satin, crape, cotton, lace, or ostrich feathers are mounted on sticks of wood, ivory, celluloid, metal, or mother-of-pearl, sometimes richly inlaid. Austria also has factories for fan-making, as well as Germany and Spain. Fans of bamboo covered with paper are exported in large numbers from China and Japan.

**Feathers.** The great bulk of the feathers dealt with in commerce are of the common kinds used for beds and upholstery. The feathers of ducks, geese, and gulls are much used, partridge feathers are exported from Hudson Bay, and turkey feathers are utilised in the United States and Hungary. The down of the duck and goose are most common, the best being that of the eider (*q.v.*), while swan's down is very expensive. The quills of the goose are still used for writing, and crowquills by artists. Among ornamental feathers the principal are ostrich, maraboo, grebe, argus, heron, bird of paradise, and humming-bird, which are dealt with under those heads. *See* also **Bird-skins.** *See* Plates 122, 123, 124.

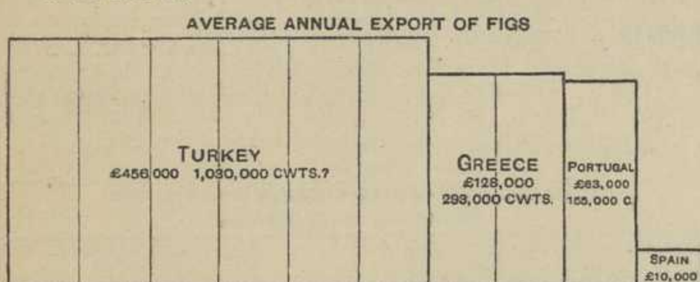
**Felt,** a material made of wool, damped and pressed between heated rollers, which by a lateral motion cause the innumerable hairs which cover the fibres to interlock. Felt is made into carpets and gun-wads, is used to cover pianoforte hammers, &c. Roofing felt is a coarse kind saturated with pitch or coal-tar. Felt hats are made of wool, fur, and silk, the shorter fibres of Australian wool being much used for this purpose.

**Fennel.** The seeds of the common fennel are largely used in Germany as a condiment and medicine. Still better are the seeds of the Italian *Fœniculum dulce.* The Indian fennel is *F. panmorium*, that of the Cape *F. capense.* The seeds contain a volatile oil.

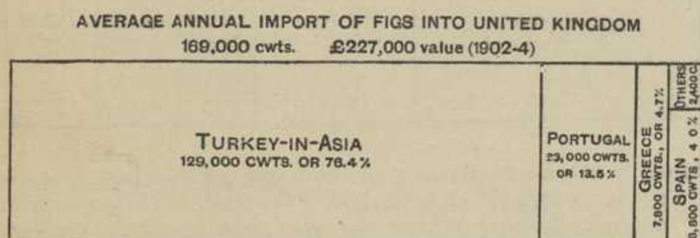
**Fibres.** For animal fibres *see* under the headings **Alpaca, Mohair, Camel's Hair, Hair, Silk,** &c. Flax, hemp, and jute (Plate 117), cotton (Plate 109), piassava, Manila hemp, esparto, paper mulberry, sunn hemp, aloe, raphia, and other vegetable fibres are entered separately. For rhea or ramie *see* **Grass Cloth.**

**Figs,** a genus of trees of the order Urticaceæ. The common fig (*Ficus carica*) grows in most of the countries round the Mediterranean. The best dried figs come from Smyrna, and are of three qualities, Eleme, Erbeli, and Aidin. They are not only eaten as fruit, but, particularly in Austria, are mixed with coffee. A spirit also distilled from figs is exported from Smyrna, the East Indies, and America. Other species of figs yield various useful products—the sycamore (*F. sycomorus*) wood, *F. elastica* india-rubber, and *F. religiosa* (the banyan) fibres and lac.

AVERAGE ANNUAL EXPORT OF FIGS




AVERAGE ANNUAL IMPORT OF FIGS INTO UNITED KINGDOM
169,000 cwts. £227,000 value (1902-4)




**Filberts.** *See* **Nuts.**

**Fir.** *See* **Timber** (Plate 157).

**Firebricks.** *See* **Clay.**

**Fitch.** *See* **Polecat.**

**Flannel,** a kind of woollen fabric composed of carded fibres lightly fulled. Ordinary flannel is woven of loosely spun yarn. *See* **Wool** (Plate 113).

**Flavine,** a dyeing preparation made from quercitron bark.

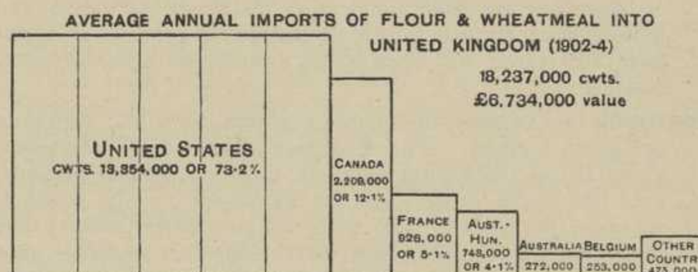
**Fleece.** *See* **Wool** (Plate 113).

**Flock,** refuse wool, old cotton husks and other waste used to stuff cheap mattresses.

**Floor-cloth.** *See* **Oil-cloth, Linoleum.**

**Flour,** ground grain, usually taken to mean ground wheat, unless otherwise stated. The United States is a great producer of flour, exporting annually more than 18 million barrels of 196 lbs. each. In 1904 the quantity exported was very much less, but the exports in the latter months of 1905 and in 1906 show that the United States is regaining much of its importance as a source of supply, at least for a time. There was a very good harvest in 1905. Canada and Austria are also exporting countries, the flour of Hungary being of excellent quality. In the imports of wheat on Plate 64, flour is represented by its equivalent in grain. The inner part of the grain yields the finest and whitest flour, though also the least nutritious. The bran, or meal from the husk, is now used for feeding cattle and poultry and for cleaning and brightening goods in dye works. In many countries maize, rye, barley, and other grains are ground and made into bread, and to a smaller extent enter into international commerce. Large quantities of Indian corn are ground in the United States, largely for fodder, and some meal is exported.

AVERAGE ANNUAL IMPORTS OF FLOUR & WHEATMEAL INTO UNITED KINGDOM (1902-4)




**Flowers.** There is an increasing trade in cut flowers from Italy, the Riviera, and the Scilly Islands. Artificial flowers are especially a Parisian product, though the industry is also making great strides in Germany, especially Saxony.

**Fluor Spar,** or Fluorite. Often called Derbyshire Spar, because it is abundant in that county. It is of many colours, and being comparatively soft, is easily worked into vases and other ornaments, the blue spar or "Blue John" being generally chosen. Ground into powder it is one of the ingredients of fine porcelain, and it is useful as a flux for the reduction of metallic ores.

**Fox.** The most numerous skins are those of the red fox of America (*Vulpes fulvus*), and the steppe fox (*V. corsac*) of Central Asia supplies a large number. The most valuable is the skin of the black fox of Siberia and North America (*V. nigra*); then the silver fox and the blue Arctic fox (*V. lagopus*) are most esteemed (Plates 122, 123).

**Frankincense,** a resinous gum, also known as Olibanum, that exudes from the bark of various species of *Boswellia*, growing in North Africa, Arabia, and the East Indies, but chiefly exported from Aden. Much of it comes from Somaliland, where it is obtained from *B. Frereana*, and is called Mayeta, from the port, Mahet. Resin from other trees, as species of *Icica* and *Croton* in America, are also frequently called Olibanum, and the common frankincense of pharmacists is the product of the common fir.

**French Berries.** *See* **Avignon Berries.**

**French Plums.** *See* **Prunes.**

**French Polish.** *See* **Varnish.**

**Frieze,** a coarse woollen cloth with a nap on one side.

**Fuchsine,** an aniline dye, which produces all the red tints.

**Fuller's Earth,** a clay consisting chiefly of silica alumina and water, which has a remarkable power of absorbing grease, and therefore is used for fulling cloth. It is found in the Jurassic strata of England, in Saxony, Bohemia, near Aix-la-Chapelle, in Normandy and Alsace, and in Kimolos, one of the Cyclades.

**Fusible Metal,** an alloy of bismuth, lead, and tin, which melts at a temperature below that of boiling water. It is used in stereotyping and taking casts of medals, &c.

**Fustian,** a name of certain heavy cotton fabrics, chiefly used for workmen's clothing. Among them are velveret, velveteen, moleskin, and corduroy. They are almost all of the nature of velvet, that is, the warp is raised into loops, but in corduroy the loops are not cut.

**Fustic,** the wood of a thorny tree, called moral (*Maclura* or *Morus tinctoria*), largely used for the extraction of a yellow dye. The best qualities come from Cuba and Mexico. *Rhus cotinus*, which grows in Southern Europe and the West Indies, also yields a yellow dye, and is sometimes called young Fustic.

**Galam Butter.** *See* **Butter-tree.**

**Galangale,** the root imported into Europe is the lesser Galangale, or the root of *Alpinia officinarum.* It belongs to the genus Zingiberaceæ, and grows chiefly in Hainan and the adjoining peninsula of the Chinese mainland. The roots are used as a substitute for ginger. In the East the root of the greater galangale (*A. galanga*) is similarly employed.

**Galbanum,** a gum resin, derived from *Ferula galbaniflua* and *F. rubricaulis*, umbelliferous plants of Persia. It exudes from the stems and base of the leaves and contains a volatile oil. Plasters are made of it, and occasionally it is administered internally.

**Galena,** or Lead Glance, lead sulphide, the most important of lead ores. Very frequently it contains an admixture of silver and other minerals. *See* **Lead** and **Silver** (Plate 144).

**Galipot.** *See* **Turpentine.**

**Gall,** the bile accumulated in gall bladders. Ox gall is used for removing grease and in mixing colours, which then adhere more readily to the surface painted on.

**Gallic Acid,** an acid contained in gall-nuts, valonia, divi-divi, and other vegetable products. It forms nearly colourless acicular crystals. It is a good astringent, and sometimes takes the place of gall-nuts in the manufacture of ink. Pyrogallic acid, obtained by subjecting crystals of gallic acid to strong heat, is used in photography.

**Galls,** gall-nuts, nut-galls, or oak-apples, are abnormal growths produced in various trees and plants by the deposition of the eggs of certain insects. They contain tannic acid, and therefore are employed in tanning leather; also in the manufacture of ink. The oak-nuts of the Levant from Aleppo, gathered from *Quercus infectoria*, are the best. Galls are also exported from Persia, China, and Japan. Average imports into the United Kingdom in the years 1902–4, 15,126 cwts. (£36,959).

**Galvanised Iron,** iron dipped into melted zinc. Roofing plates, buckets, wire, &c., thus coated are less liable to rust.

**Gambier,** or Gambir, is an earthy-looking, light-brown substance prepared from the young leaves of *Uncaria gambir*, a climbing plant of the order Rubiaceæ, which grows in the Malay Peninsula and Archipelago. Being in its rough state adulterated with a large proportion of cutch, it is often called pale catechu, and it is also known as Terra Japonica. In Europe dyers and calico-printers use gambier to produce black and brown shades. About 8000 tons (£197,000) are imported into the United Kingdom, chiefly from the Straits Settlements.

**Gamboge,** or Camboge, a gum resin that exudes from the trunk of *Garcinia morella* and other allied species of Guttiferæ, which grow in Cambodia, Siam, and Ceylon. In medicine it is used as a violent purgative, and it forms yellow water-colours and varnishes.

**Garancine,** a dyeing extract prepared from madder.

**Garnets,** a red stone which is often set in jewellery. There are several kinds, composed of lime, magnesia or iron, and alumina or lime, with iron or chromium. The best are the so-called Syrian garnets from Syriam in Pegu. Bohemia and Spain also produce these stones. Common opaque garnets are used as abrasive material, and more than 3000 tons are mined for this purpose in the United States.

**Garo Wood,** a name for the **Lign Aloes** (*q.v.*) of Malacca.

**Gasolene.** *See* **Petrol** and **Petroleum.**

**Gauze,** an open fabric of silk, cotton, or linen, in which the threads of the warp are crossed between each thread of the weft. The best silk gauzes are chosen for crape. For wire gauze *see* **Wire.**

**Gelatine.** *See* **Glue.**

**Genette,** a genus of small carnivores sometimes included among the civets. They live in Africa, and the common genette is also found in the south of Europe and Syria. The fur is an article of commerce.

**Geneva.** *See* **Hollands.**

**Gentian.** The roots of the common yellow gentian (*Gentiana lutea*) are gathered in the Alps, and are much employed in medicine as a stomachic. Bitters are also made from them. The roots of other species are less valuable.

**Geranium Oil,** used as a substitute for oil of roses. The true oil is obtained from *Pelargonium radula*, but oil is also obtained from other species, and it is further mixed with Andropogon oil. *See* **Grass Oils.**

**German Silver,** an alloy of copper, nickel, and zinc, much used for making spoons, forks, jugs, teapots, &c., which are frequently plated with silver.

**Ghee,** a fluid butter made in the East from the milk of buffaloes. The milk is boiled before churning.

**Gin,** a British spirit distilled from grain and flavoured with oil of turpentine and common salt. *See* also **Hollands.**

**Gingelly.** *See* **Sesamum.**

**Ginger.** Most species of Zingiberaceæ produce rhizomes, useful as condiments and stomachics. *Z. officinale* is cultivated in the East Indies, West Indies, and Sierra Leone. Jamaica ginger is considered the best. The roots are preserved in syrup or candied. Black ginger and white ginger are the results of different modes of treatment, and the difference of shade is not great. Ginger ale and ginger beer are articles of commerce. The United Kingdom receives about 40,000 cwts. (£60,000) annually, most of it from China.

**Gingham,** a cotton material woven of threads previously dyed. Originally made in India, but now chiefly in Manchester and Glasgow.

**Ginseng,** the root of *Panax ginseng*, in great repute in China as a medicine. The most prized is the ginseng of Korea. The North American species, *P. quinquefolium*, is also imported into China, but fetches a lower price.

**Glass.** Glass is a silicate of soda or potash combined with an alkaline earth, or some other basic material. The sands of Lynn in Norfolk, Alum Bay, Isle of Wight, and Hastings are almost pure silica. In France the best deposits are at Fontainebleau, and the United States is said to possess the finest of all glass sands in the west of Massachusetts and in other parts. There are various kinds of glass, chief of which are window glass, made of silicate of soda and lime; Bohemian glass, of silicate of potash and lime; flint glass or crystal, of silicate of potash and lead. Window glass may be crown, sheet, or plate. The first is blown out into a disc, the second is blown into a cylinder, which is then cut open, and the third is cast on a table. Venice and Bohemia are especially noted for their coloured glass, and Germany is a great manufacturer of bottles. The chief exporting countries are Belgium, Austria-Hungary, and Germany. The United States is a large producer, but does not supply enough for home consumption. *See* also **Plate Glass.**

**Glauber's Salts,** nitrate of soda, which occurs in many salt lakes and mineral springs, and is largely manufactured from common salt and sulphuric acid. It is employed in the manufacture of glass, in dyeing, for the production of carbonate of soda, &c., as well as in medicine. Great Britain holds the first rank as manufacturer of salts of soda. *See* **Soda.**

**Gloves.** The manufacture of kid gloves flourishes most in France (Paris and Grenoble), though considerable quantities are also made in Vienna, Belgium, Germany, and other countries. Lamb and sheep skins are made into gloves of an inferior quality. Calf and dog skins serve for stronger gloves. Germany, England, and Switzerland produce gloves of cotton, wool, and silk. Worcester, Yeovil, Ludlow, and London are great centres of the industries.

**Glucose.** Dextrose or grape-sugar, the most important of the glucoses, is produced by the action of sulphuric acid on maize, potatoes, and other starchy matter. It is now extensively employed in the manufacture of beer and in improving poor wines. Glucose is exported in a solid or liquid state from Germany, Belgium, and the United States, &c. In the years 1902–4 the average imports into the United Kingdom were 1,259,644 cwts., valued at £596,887.

**Glue,** an impure gelatine, which is contained in almost all animal substances. The best is made from skins, and the refuse of tanneries is used up in its manufacture. Bone glue, a by-product obtained in the manufacture of animal charcoal, is inferior. Gelatine is a carefully made glue from selected portions of the ox. *See* also **Isinglass.**

**Glutton.** *See* **Wolverine.**

**Glycerine,** a sweet colourless syrup which is an ingredient of fats, and is obtained as a by-product in soap and candle works. It is applied to many purposes—in medicine, in perfumery, in improving wines, in calico-printing, and the preparation of leather. Large quantities are required for making nitro-glycerine, dynamite, and other explosives.

**Goa Powder,** a powder found in the wood of *Andira araroba*, a native of South America. Chrysarobine is a drug extracted from the powder.

**Goats.** The domestic goat is kept in all European countries, particularly in mountainous regions, to which they are well suited. The milk is rich, and cheese is made from it. The skins are tanned, and, when sumach is used, become morocco leather. The horns supply material for knife-handles and turned articles. The Angora goat (*Capra hircus, var. Angorensis*), a native of Angora in Asia Minor, has been introduced into Europe, North America, Australia, and Cape Colony. Its white, soft, and silky hair is of great value for shawls and other articles. The Kashmir goat (*C. hircus, var. laniger*) is almost equally valuable.



**Gold-beaters' Skin** is prepared from the external membrane of the cæcum of the ox. Gold-beaters lay the gold between sheets of this skin and then beat it out. The skin is also used as a plaster.

**Golden-seal Root,** Orange Root, or Canadian Yellow Root. The root of *Hydrastis Canadensis*, which yields a brilliant yellow dye.

**Gold Lace,** fabrics made of thread covered with wire. The wire is made of silver covered with a thin coating of gold, and the silver is very often alloyed with a much larger proportion of

copper. The wire is rolled flat and wound round a silk thread so as to completely cover it. In the inferior qualities thin coatings of silver and gold are deposited by electricity on a copper wire, and the very commonest quality consists of Dutch metal over a cheap white alloy.

**Gold Leaf.** *See* **Gold** (Plate 141).

**Golden Syrup,** a clear light-coloured treacle.

**Goose.** The varieties of the common goose do not greatly differ. Pomeranian, Emden, and Toulouse geese are the most noted. Holland and Germany export large quantities as food, and the *patés de foie gras* of Strasbourg and Toulouse are well known. *See* also **Feathers.**

**Grains of Paradise,** the seeds of *Amomum grana Paradisi,* a plant of the order Zingiberaceæ. They are used in veterinary medicine and in improving the flavour of inferior spirits. Another name for them is Malegueta or Guinea pepper, from the Pepper or Grain coast of West Africa. The name is also applied to the pungent seeds of other plants.

**Gram,** a Hindu name for chick-peas, and also applied to other kinds of pulse.

**Granite** is an igneous rock composed in general of quartz, felspar, and mica. Its appearance differs according to the fineness or coarseness of the grain and the colour of the crystals it contains. The finer-grained granites are used for paving streets, those with larger crystals for building. For these purposes it is quarried in many countries, in Normandy and Brittany, Italy, Switzerland, Scotland, the United States, and Quebec. Porphyritic granite (Shap granite) containing large crystals of felspar, is especially handsome.

**Grape.** *See* **Vine, Currants, Raisins.**

**Grape Sugar.** *See* **Glucose.**

**Graphite.** *See* **Black Lead.**

**Grass Cloth.** Cloth is made from several grasses, but the name is particularly given to cloth made of the fibres of *Boehmeria nivea, Boehmeria tenacissima,* and other varieties. These plants are of the nettle family, and the fibre is known as China grass, rhea, and ramie fibre. Sometimes the name China grass is used to denote the fibre *B. nivea* only. The plants are cultivated in the East and West Indies, the Cape, Mexico, &c. The Queensland grass cloth plant is another species of nettle (*Pipturus argenteus*).

**Grass Oils,** a general name for the volatile oils extracted from a variety of plants. *Andropogon warancusa* yields an oil which has a similar stimulating effect to cajeput oil; it grows on the Coromandel coast and in Bengal. *A. nardus,* cultivated in the East Indies and at the Cape, yields ginger-grass oil, which is very similar to geranium oil. Lemon grass or citronella oil is obtained from *A. schœnanthus* of the East Indies and Arabia, and is used for scenting soap. Turkish grass oil is extracted from *A. pachnodes.* Cyprus grass oil is obtained from the roots of *Cyperus esculentus,* a native of South Europe, the Levant, and Africa.

**Grebe,** a genus of diving birds much sought after for their plumage, especially the Great Crested Grebe, which frequents the rivers and lakes of Europe. The Slavonian Grebe (*Podiceps auritus*) lives in the north of Europe and Siberia. An allied species (*Podilymbus*) is found in North America.

**Greengage,** a fine-flavoured green plum. It is cultivated in England, and large quantities are imported, chiefly from France.

**Greenheart,** a hard, heavy timber, from *Nectandra Rodiei,* a tree of the order Lauraceæ, which grows in Guiana. It is remarkably durable, and resists the attacks of insects, and therefore is much used in dock and harbour works. *N. concinna* of Martinique also yields a valuable timber.

**Green Snail,** the shell of *Turbo olearius,* which furnishes a mother-of-pearl. It is collected in the East Indies.

**Grindstones,** circular blocks of sharp homogeneous sandstone. Artificial grindstones are made of fireclay, burnt hard, and of compositions of powdered sandstone, swamp iron ore, shellac, &c.

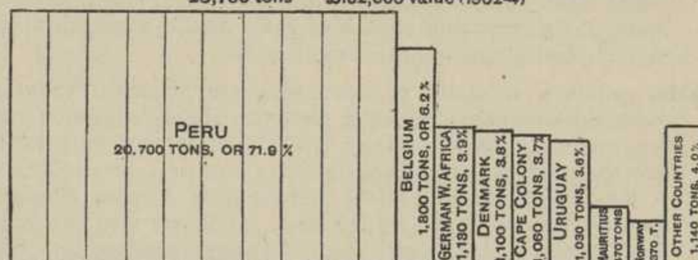
**Groats,** oats stripped of their husks.

**Ground-nuts,** called also earth-nuts, and in the United States pea-nuts. The fruits of *Arachis hypogea,* which, formed in the air, are gradually forced into the ground and ripen 3 or 4 inches beneath the surface. The plant is cultivated in the tropical countries of Africa, and thrives in Southern Europe; also in India, the Southern States of North America, and in South America. The nuts are eaten in the countries where they grow. In Europe they are valued chiefly for the oil they contain, which is used as salad oil. The residual paste is sometimes used in the manufacture of chocolate, but chiefly as a food for cattle. The roots of *Bunium bulbocastanum* and *B. flexuosum* are also called ground-nuts, and those of the American vetch *Glycine apios.*

**Guaiacum,** a genus of tropical American trees which yield lignum vitæ and a medicinal resin. The best known species is *G. officinale,* and is exported chiefly from San Domingo, Cuba, and other West Indian islands. Ships' blocks, pestles, bowls, &c., are made of it.

**Guano,** the excrement of sea-fowl collected from the islands off the coasts of Peru and Chile, from some West Indian islands, the Kuria Muria islands, and elsewhere, for the purpose of manuring land. It owes its value to the salts of ammonia and phosphates it contains. Many of the deposits are now practically worked out. The average imports in 1902–4 were 28,790 tons (£161,856), of which nearly three-fourths came from Peru.

AVERAGE ANNUAL IMPORT OF GUANO INTO UNITED KINGDOM
28,790 tons £162,000 value (1902-4)



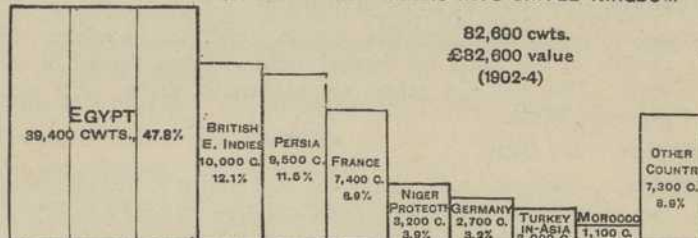

**Guarana.** The Guarani Indians of South America make bread of the seeds of *Paullinia sorbilis,* a climbing plant, and the Brazilians use them as cocoa. In the United States and Europe they are used in medicine.

**Guava,** *Psidium pyriferum,* or White Guava, is grown in the East and West Indies, and produces excellent jelly. The Red Guava, *Psidium pomiferum,* is very acid. The China Guava (*P. Cattleianum*) also makes good preserve.

**Guinea Corn,** the seeds of *Sorghum vulgare. See* **Durra.** The name is also applied to the seeds of *Penicillaria spiccata.*

**Gums.** This name is commonly applied to a variety of substances which exude from the bark or leaves of trees and plants, such as gum-resins and resins proper. True gums are of two kinds —gum arabic and gum tragacanth. The former is obtained from *Acacia Senegalensis* (or *A. verek*), *A. horrida* of the Cape, and other species. The best, pure white, comes from Kordofan, while the most highly coloured is that of Senegal. Gum arabic dissolves readily in water, whereas gum tragacanth absorbs a large quantity of water and swells, but is not properly dissolved. It is the sap of various species of *Astragalus,* and is exported chiefly from Smyrna. Fine gum arabic is expensive and is rarely found except in the chemist's shop. The commoner kinds are used in the arts. Tragacanth is also used in calico-printing and to form emulsions. It is frequently adulterated with inferior kinds of gum. Gum-resins and resins will be found under their individual names (Plate 165).

AVERAGE ANNUAL IMPORT OF GUM ARABIC INTO UNITED KINGDOM



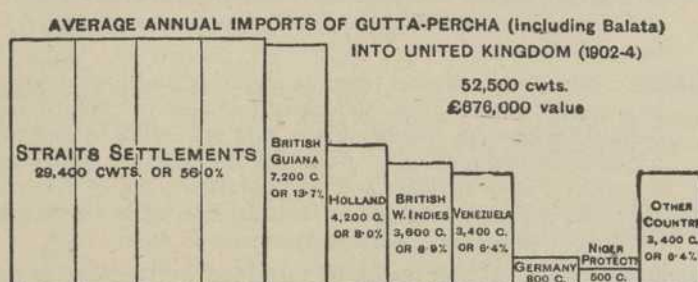

**Gun Cotton,** a powerful explosive made by soaking cotton-waste in a mixture of one part by weight of nitric acid to three of sulphuric acid.

**Gunny.** Gunny cloth and bags are coarse jute wares made in Bengal and exported for the purpose of packing cotton, grain, salt, &c.

**Gunpowder.** Gunpowder is composed of 75 per cent. by weight of saltpetre, 15 of charcoal, and 10 of sulphur, mixed together into a wet cake. This cake is broken up and formed into granules by a special machine, and glazed by friction. Mining powder, which should suddenly give out a large volume of gas and be inexpensive, is composed of very large grains and contains rather less saltpetre and more sulphur. Powder for sporting guns, on the other hand, is fine-grained. Various powders are made for military rifles and machine guns. For cannon the powder used to be moulded into cubes and was called pebble powder, but now prismatic powder, the grains of which are hexagonal prisms, 1 inch by 1¾ inches, with a hole through the middle, has superseded it. Brown powder, consisting of 79 parts of saltpetre, 18 of charcoal, and 3 of sulphur, is also made into prisms. One of the latest sporting powders is the "bulldog," containing 85 per cent. of saltpetre, 14 of charcoal, and one of sulphur. E.C. powder (Explosives Company) is granulated gun-cotton, and the older Schultze powder is finely divided cellulose saturated with nitric and sulphuric acids. With these the same velocity is obtained from a much smaller charge, and they are nearly smokeless.

**Gurjun Oil,** or Wood Oil, is obtained from the nuts of *Dipterocarpus turbinatus* and other species that grow in India. It is used medicinally for external application, and in the manufacture of varnishes. Copaiva balsam is often adulterated with it.

**Gutta-percha,** the inspissated sap of certain trees of the order Sapotaceæ. The best is obtained from *Dichopsis* or *Palaquium gutta*, *Dichopsis* or *Palaquium oblongifolium* and other species, while a somewhat inferior sort called Soondie is derived from *Payena* species, especially *Payena Leerii*. The juice oozes out of cuts made in the bark, and attempts have been made to extract it from the leaves and twigs. True gutta-percha is found only in Sumatra, Borneo, and the Malay Peninsula, within a distance of 5° on either side of the equator. It differs from caoutchouc in becoming soft and plastic in hot water or air, when it can be moulded into any form, whereas caoutchouc retains its elasticity and tension. The high non-conductivity of gutta-percha has led to its use in coating telegraph wires, especially for cables, and in this way probably two-thirds of the gutta-percha collected is employed. It is also made into funnels, bottles, syringes, stoppers, and many other small articles. When deprived of its resin it is the best material for golf balls, being exceedingly tough and elastic. Many substitutes for gutta-percha have been tested, but none has been found satisfactory, except Balata, which possesses the peculiar properties of gutta in a less degree. More than 2500 tons of gutta-percha are exported annually from Singapore. Balata is the juice of the Bullet tree, *Mimusops balata*, which grows in Jamaica, Trinidad, Venezuela, and the Guianas. The chief exports are from British and Dutch Guiana. *See* also **India-Rubber** (Plate 156).




**Gypsum.** *See* **Plaster of Paris.**

**Haddock.** *Gadus æglefinus*, a fish of the cod genus which is abundant on the northern coasts of Europe and America. *See* **Cod** and **Fisheries** (Plate 105).

**Hair.** Many kinds of hair are dealt with in international trade. Firstly, there is human hair, which is worked up into wigs, switches, &c. The hair is obtained from France, Austria, Germany, and other countries, and is manufactured in France and Germany. A large quantity of human hair is exported from China, but it is of poor quality. The hair from the manes and tails of horses is woven into carpets and cloth for upholstery. The best is the hair combed from living horses. Short hair is used for stuffing furniture, and is often mixed with cow and pig hair. Cow hair is also used to bind plaster and in the manufacture of felt. Hair is exported from Russia, Uruguay, Argentina, Germany, &c. Camels' hair is woven in the East into material for clothing, carpets, &c., and is imported into Europe and America for weaving into carpets and mixing with wool. *See* **Camels' Hair.** The under hair of the Angora and Kashmir or Tibetan goat makes excellent shawls, and is imported in considerable quantities into Europe. *See* **Mohair.** The hair of other goats is also utilised. In the years 1902–1903 the imports into the United Kingdom of common goats' hair averaged 3,418,000 lbs. (£64,260), and the unenumerated hair was valued at £121,300.

**Halibut,** the largest of the flat fishes (*Hippoglossus vulgaris*), sometimes attaining a weight of 500 lbs. It is abundant on the northern coasts of Europe and North America, and as far north as Spitzbergen and Greenland.

**Hams.** The best are York hams. Westphalia, Brunswick, and Mayence are noted for their hams, and also Bologna. Large quantities are cured at Chicago. The average imports into the United Kingdom in 1902-4 were 1,289,000 cwts. (£3,368,800), most from the United States, but a considerable quantity also from Canada.

**Hare.** The hair of the hare is used in making felt hats, and the back pieces of the skin sometimes as fur. The best skins come from Asiatic Russia, the Crimea, Saxony, and Silesia.

**Hartshorn.** Ammonia is often called spirits of hartshorn, because a product of distillation from the horns of the red deer, chiefly ammonia, was formerly used in medicine.

**Hats.** The chief kinds of hats are felt hats, silk hats, and straw hats. The first are made chiefly of rabbit fur, with an admixture of hare, beaver, musk-rat, and vicuña hair in the finer qualities, and of wool in the cheaper kinds. Some of the very commonest are made of wool and cotton or other vegetable fibres made to cohere by gum. Silk hats are made of fine silk plush which is applied with the aid of lac and Dammar varnish to a form consisting of two or three layers of cotton cloth saturated with varnishes. Straw hats are made of fine wheat straw, split and plaited, the best being woven in one piece. Rice straw is used in Italy, wood chip of the fine poplar and willow in Bohemia and the Black Forest. In America palm leaves are employed in the manufacture, and this material is imported into Europe. *See* **Chip.** Of this kind of hat the best is the Panama, woven of the leaves of *Carludovica palmata*, a species of screw pine. The best Panama hats are made at Jipijapa in Ecuador. A new material, *paille de chouchou*, from Réunion, has been introduced.

**Hazel-nuts.** *See* **Nuts.**

**Hellebore,** an active poison obtained from the roots of *Veratrum album* and *viride*. It is used as an insecticide and sparingly in medicine. Black hellebore is extracted from the roots of *Helleborus niger*, the Christmas rose. It is not so much applied in medicine as it used to be.

**Hematite,** red oxide of iron, found chiefly in Cumberland, Elba, near Lake Superior, and in Alabama.

**Hemlock Fir,** the bark of the Canadian hemlock spruce (*Tsuga Canadensis*) is used in tanning, and an extract of it is exported from Canada and the United States.

**Hemp.** *See* Plate 117.

**Henbane,** the fruit and leaves of *Hyoscyamus niger* and *H. albus* are used as sedatives both internally and externally. The plants grow mostly in the countries round the Mediterranean Sea.

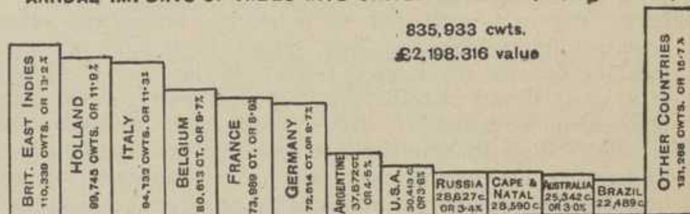
**Henequen.** *See* **Sisal Hemp.**

**Herring.** The herring, *Clupea harengus*, is one of the most important food fishes. It is found in the seas of Northern Europe and in the Arctic Ocean, but is rare off the coasts of Iceland and Greenland. Southwards it does not extend beyond the British Channel. The herring of the southern states of North America is a different variety (Plates 106, 107).

**Hessian,** a packing material made of jute.

**Hickory Nuts.** *See* **Pecan Nuts.**

**Hides.** The hides of many animals are cured and are exported chiefly for the purpose of making leather. The most generally used are those of the ox, cow, bull, and calf, which are obtained from local slaughter-houses, and are also exported in large quantities from Australia, the Cape, and South America, either wet or dry salted. Small hides and buffalo hides come from the East Indies. The hides of the horse, sheep, deer, dog, kid, and kangaroo are also tanned and made into various articles. *See* **Gloves, Leather.**



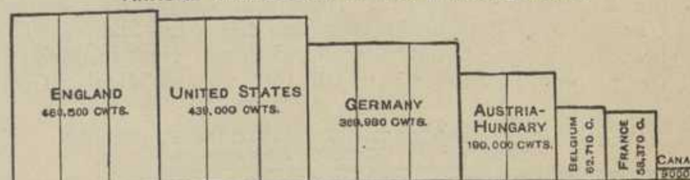

**Hollands,** a gin made in Holland, principally at Schiedam, and in Germany, from rye-meal and malt, and flavoured with juniper (*genévrier*); whence the name gin.

**Honey.** Apiculture is carried on in almost all European countries, and the annual production is estimated at about 80,000 tons. Many extra European countries also export honey in considerable quantities—Tunis and Algeria, North America, especially California, South America, especially Chile, and New Zealand. The best honey is obtained from the flowers of the lime-tree and from heather, and spring honey is better than autumn honey. "Virgin" honey is contained in pure white combs which have never been used for the incubation of eggs. In order to extract all the honey the comb is pressed and heated, but this is effected more advantageously with centrifugal machines.

**Hoofs.** *See* **Horns.**

**Hoop Iron,** thin straps of iron used to secure bales of cotton and other goods.

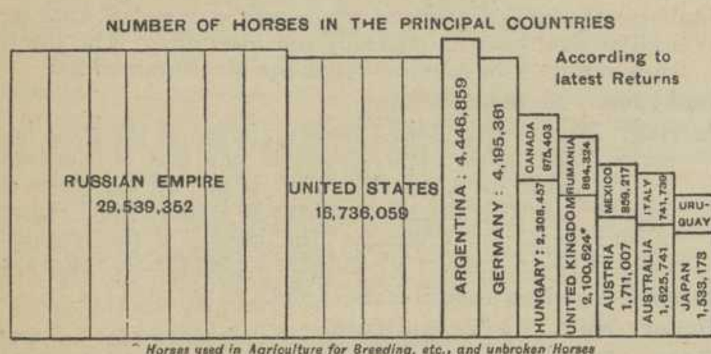
**Hops.** The female flowers of the hop plant (*Humulus lupulus*) are used in the manufacture of beer and hop bitters. The chief producing countries are Great Britain, the United States, Bavaria, and Austria. The crop is very variable, hops being very dependent on the weather and subject to the attacks of insects.

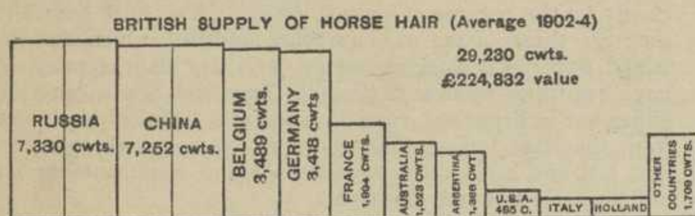





**Horns.** The horns of cattle, antelopes, sheep, goats, and other animals are manufactured into handles for umbrellas, and walking-sticks, handles of knives, drawer-knobs, boxes, buttons, and other articles. Rhinoceros horn from the East Indies and Africa fetches a high price. Hoofs are also used for the manufacture of buttons and other small articles, and from the hoofs of small animals and the refuse Prussian blue and ammoniacal salts are obtained.

**Horses.** The horse is distributed throughout the temperate and subtropical zones of the world, particularly in countries settled by Europeans. In Europe the chief exporting countries are Russia and Hungary. A large number pass through Belgium, and English horses are exported to improve the breed in foreign countries, and as riding and carriage horses. The United States exports more than any European country except Russia. Horse flesh is eaten in some foreign cities, and besides this, the horse furnishes hides, hoofs, horse hair, and horse grease, used as a lubricant, the last being manufactured to a large extent in the Argentine Republic.




**Hosiery,** frequently restricted to stockings, socks, and other coverings for the feet and legs; hosiery in its more extended meaning denotes any knitted article, that is, a textile formed of a single thread instead of a warp and weft. Waistcoats, blouses, under-garments, shawls, hoods, and various other articles of dress are manufactured in cotton wool or silk, either by hand or by knitting machines. The industry is spread over Europe and countries peopled by Europeans, but flourishes most in Great Britain, France, and Germany.

**Huckaback,** a coarse linen towelling.

**Ice.** Though ice is now made in most countries artificially, there is a considerable export of natural ice from Norway and the United States. In Norway most of the ice is obtained from the Wenham lake, near Drobak, Christiania fiord, which has been named after a lake near Boston, U.S.A. Switzerland and Italy also export ice.

**Iceland Moss,** a lichen (*Cetraria Islandica*) which grows in all northern regions and is exported from Norway. It is often used as a food in the countries where it grows, but elsewhere only for invalids.

**Iceland Spar,** a form of calcite, which exhibits in a marked degree the phenomenon of double refraction. Crystals obtained at the Eski fiord, Iceland, are used in optical instruments.

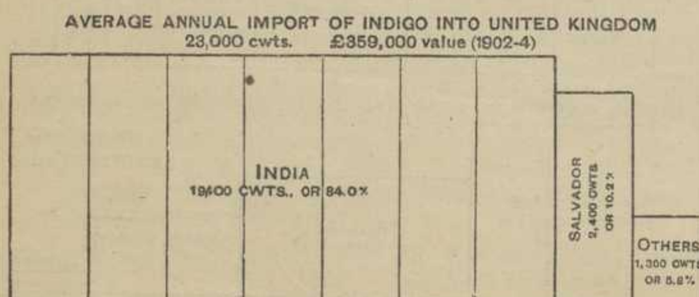
**Ignatius Beans,** the seeds of *Ignatia amara*, a native of the Philippines, and cultivated in Cochin-China. Strychnine, of which they contain a large proportion, is extracted from them.

**Indian Corn.** *See* **Maize.**

**Indian Hemp.** *See* **Deccan Hemp.**

**India-rubber.** *See* Plate 154.

**Indigo,** a beautiful and very durable blue dye obtained from several plants. The best is yielded by leguminous plants, the *Indigofera tinctoria* of India and the *I. Anil* and *I. Guatemala* of Central America and the West Indies. The best indigo comes from Bengal and Java. Next in quality is the indigo of Salvador, Guatemala, Caracas, and Manila. Good




indigo is of a dark blue or purple colour, and when rubbed assumes a coppery lustre. Artificial indigo is made from coal-tar. Chinese indigo is a green dye extracted from the bark of *Rhamnus utilis* and *R. chlorophorus* (buckthorns). British imports averaged, 1902–4, 23,064 cwts. (£359,296), the greater part from India.

**Inks.** Writing ink should be fluid enough to leave the pen freely and should adhere to the fibre of the paper or the glaze. It should also retain its colour with age. Salts of iron mixed with vegetable substances containing tannic or gallic acid are the most generally satisfactory. Galls and sulphate of iron, with a little gum arabic, and a very small quantity of carbolic acid, make a good ink. Logwood is also used. Sugar, gum, or glycerine, are added to produce a copying ink, these materials protecting the ink from oxidization. Printing ink is rendered viscous by the addition of drying oils to lamp black. Lithographic ink is a soapy fluid containing fatty matter, which is absorbed into the stone. The printing ink settles on the parts where the lithographic ink has penetrated. Marking ink is composed of salts of silver, or platinum, and sometimes of aniline. Indian ink is a mixture of very pure and fine lamp-black with agar-agar, gum, or gelatine.

**Insect Powder.** The buds of *Pyrethrum carneum* and *P. roseum*, natives of the Caucasus and Persia, are when powdered very efficacious in destroying insects. The Dalmatian powder from *P. cinerariafolium* is considered superior. The flower-stalks are also reduced to a coarse powder for the use of dealers in furs and skins.

**Iodine,** a non-metallic element used in medicine and photography. It is applied externally in the form of ointment or tincture, and iodide of potassium, iodide of iron, and red iodide of mercury are administered internally. Iodine is still obtained from kelp, especially *Fucus digitalus* and *F. saccharinus*, but of late the European industry has found a formidable rival in the manufacture of iodine from Chilian saltpetre.

**Ipecacuanha,** a valuable medicine furnished by the root of the Ipecacuanha plant (*Cephaëlis ipecacuanha*) of the cinchona order. The largest quantity is sent down the Paraguay river from Matto Grosso. The plant is now cultivated in India and Ceylon. Ipecacuanha is administered in powder and in the form of wine. Compound Ipecacuanha powder is commonly known as Dover's powder.

**Iridium,** a rare and very hard metal found in platinum ores and usually in association with osmium. Being very hard and unaffected by acids, it is used frequently as an alloy with platinum for contact points in telegraphy, and the parts of scientific instruments most liable to wear. With iridium and its compound with osmium gold pens are tipped. The sesquioxide furnishes a black and grey colour for porcelain painters.

**Irish Moss.** *See* **Carrageen Moss.**

**Iris Root.** *See* **Orris Root.**

**Iron.** *See* Plate 125.

**Ironwood,** a name given to the timber of several trees, chiefly natives of tropical countries, which have the common properties of extreme hardness and heaviness, some of them sinking in water. *Metrosideros vera*, of the order Myrtaceæ, *Mesua ferrea* and *speciosa*, of the order Guttiferæ, are natives of the East Indies; *Olea Capensis* is the ironwood of the Cape, while *O. laurifolia* is known there as black ironwood, and *Vepris undulata* as white ironwood; and various species of *Sideroxylon* grow in Guadeloupe, Guiana, Réunion, and East Africa. The ironbark of Australia, *Eucalyptus sideroxylon*, is made into wheel spokes. The wood is used in the countries where these trees grow, but is imported only in small quantities into Europe, its hardness and heaviness being considered a disadvantage.

**Isinglass,** originally the dried swimming bladders of the sturgeon, and exported almost exclusively from Russia. It has, however, been found that the bladders of other fish and also the ova yields equally good isinglass, and considerable quantities of these dried articles are exported from America and India. Isinglass is more readily extracted from them than from other material. It is used in confectionery, in lustring ribbons, cement, &c. The imports have of late been about 11,000 cwts. annually, worth about £135,000.

**Ivory.** *See* Plate 165.

**Ixtle,** or Tampico fibre, extracted in Mexico chiefly from *Bromelia sylvestris*, though some is obtained from various kinds of agave. It is much stronger than hemp, and is used for making ropes, &c.

**Jaborandi,** the dried leaflets of *Pilocarpus pennatifolius*, a bush that grows in Brazil. They are used in medicine. In South America the name is given also to other species of *Pilocarpus* and various Piperaceæ.

**Jacaranda,** the hard, heavy brown wood of *Jacaranda Brasiliana* and other species indigenous in South America. The leaves of some species are administered as blood purifiers. The name rosewood is sometimes applied to this timber.

**Jaconet,** a plain cotton cloth of medium thickness and weight.

**Jade**, nephrite, a variety of hornblende much prized in China as a material for personal and other ornaments. Mines of nephrite are regularly worked in Chinese Turkestan, and the mineral also occurs in New Zealand. Much of the jade sold in China is really jadeite, a variety of pyroxene, obtained in Burma, whence about 4000 cwts. are exported.

**Jaggery**, an Indian name for coarse palm sugar.

**Jaguar.** *See* **Ounce.**

**Jalap**, a purgative medicine extracted from the root of *Ipomœa purga* of the order Convolvulaceæ, a native of Mexico. It derives its name from the Mexican city Jalapa. Besides the roots the resin extracted from them is exported. Other varieties, *I. simularis*, or Tampico jalap, and *I. Orizabensis*, are of inferior quality.

**Japan Wax**, a varnish obtained from *Rhus vernicifera*, much used in Japan.

**Japanned Goods.** *See* **Lacquered Ware.**

**Jarrah Wood.** *See* **Eucalyptus.**

**Jasmine**, the jasmine (*J. officinali*), a native of Asia, is cultivated in the south of Europe, as well as *J. grandiflorum*, which is especially common in the neighbourhood of Cannes. *J. sambac* is another species growing in the East Indies. An essential oil is distilled from the flowers, which is, however, too dear to meet with a large demand, and the oil of jasmine is generally Ben oil, sometimes scented with jasmine.

**Jawar.** *See* **Durra.**

**Jean**, a twilled cotton cloth.

**Jerked Beef**, salted and dried strips of beef (*charqui*) in which there is a considerable trade in South America and the West Indies. It is not appreciated in Europe.

**Jet**, a hard kind of lignite which takes a good polish and is made into articles of mourning jewellery. It is found at Whitby, in England, in the Department of the Aude, France, in several parts of Germany and Hungary, and at the town of Villaviciosa in the Asturias, Spain. Imitation jet is made of glass and vulcanised india-rubber.

**Jewellery**, the chief centres of high-class jewellery manufacture are Clerkenwell in London, Paris, Geneva, Vienna, and New York. Malta and Venice are noted for their filigree, and Naples for coral ornaments. Cheap jewellery, especially articles made of imitation gold, electro-plated metal, rolled gold, &c., is manufactured in Birmingham, Germany, France, and to some extent in all countries.

**Jew's Ear**, a fungus (*Exidium auricula Judæ*), one of the Hymenomycetes. It was formerly valued as an astringent and is still sold by chemists. Another fungus, *Polyporus versicolor*, is often substituted for it. Some species are eaten in China and Japan.

**Jipijapa.** Panama hats are sometimes called Jipijapa hats after a town in Ecuador noted for the manufacture.

**Job's Tears**, an Indian grass (*Coix lachryma*) bears seeds which are used as beads in rosaries, necklaces, &c. The plant is also cultivated as a cereal.

**Jonquil**, an essential oil is extracted from the flowers of the yellow narcissus (*N. jonquilla* and *odorus*) for the composition of perfumes.

**Judas Tree.** *Cercis siliquastrum* grows in South Europe and Asia, and *C. Canadensis* in North America. The green-veined wood is esteemed by cabinetmakers, and the seeds form a substitute for capers.

**Jujube.** The real jujube is the fruit of the thorny shrub or small tree called *Zizyphus*, of which there are about fifty species growing in the tropical and sub-tropical countries of Asia and America and in the south of Europe. The chief are the common jujube (*Z. vulgaris*), the Christ's thorn (*Z. spina Christi*), the Indian jujube (*Z. jujuba*), with large fruits, and the lotus (*Z. lotus*). The dried fruits are an article of commerce. The jujubes of shops are a composition of gum and sugar.

**Juniper Berries.** An oil is extracted from the berries of the juniper, with which gin is flavoured. When the berries are ripe the oil turns into turpentine.

**Jute.** *See* Plate 117.

**Kaffir Corn.** *See* **Durra.**

**Kainite**, a compound of chloride of potash and sulphate of magnesia, found in the Stassfurt salt mines, Prussian Saxony, and at Kalusz in Galicia. It is used as a manure.

**Kaissa-pyta**, a pressed cake of apricot pulp made in Cyprus.

**Kali**, the Arabic name for an alkali (*al-kali*) from which the chemical symbol for potash is derived. In commerce it denotes a soluble tartrate of potash.

**Kamala**, a powdery substance in the fruit capsules of *Mallotus Philippinensis*, a tree which grows in south and east Asia. The powder, shaken or rubbed off the seeds, is used as a dye. It is also applied medicinally.

**Kangaroo.** The skins of kangaroos and wallabies are exported from Australia, and when properly curried become a very tough and pliable leather suitable for light boots. The annual export from Australia is of the value of about £230,000.

**Kaolin**, or China clay. Weathered potash felspar, or orthoclase, when occurring in large masses free from quartz and mica, is digged out for the manufacture of porcelain. It is named after the Kao-ling or "high ridge" in the province of Kiang-si, China, and is also found in Cornwall, France, Germany, and the United States of America. Kaolin is used to a considerable extent by papermakers.

**Kapok**, a name used by the Dutch for the fibre of *Eriodendron anfractuosum*. *See* **Silk-cotton.**

**Kauri.** *See* **Cowry.**

**Kauri Gum**, the resin of *Dammara Australis*, which is obtained in New Zealand and Australia as a fossil and also from living trees. In 1904 New Zealand exported 9203 tons (£501,817). *See* **Dammar.**

**Kekune Oil**, the oil extracted from the seeds of *Aleurites triloba*. *See* **Bankul Oil.**

**Kelp**, the ashes of burned seaweed. The varieties most valued for the purpose of obtaining chemicals are species of *Fucus*, as *F. nodosus* and *serratus*, *Laminaria* and *Himanthalia*. When burned they are reduced to about one-twentieth of their original weight or less. From the crude kelp, soda, chlorate of potash, and iodine are obtained, paraffin oil, naphtha, and sulphate of ammonia. The manufacture of kelp is carried on in Great Britain and France, but has fallen off owing to competition with other sources for the chemicals it yields. *See* also **Barilla.**

**Kermes**, several species of *Coccus*, especially *C. ilicis*, are collected from the oak *Q. coccifera* for use in dyeing. The female insects contain the same colouring matter as cochineal, but in a far smaller proportion. Hence their use has almost died out except for dyeing domestic manufactures in Spain, Morocco, Algeria, and other Mediterranean countries where the insect abounds. Kermes is also the name of a red mineral, a compound of sesquisulphide and sesquioxide of antimony, which was formerly employed in medicine.

**Kerosene.** Paraffin, petroleum, and shale oils sold for burning are known by this name in America, India, China, and the British colonies.

**Kersey**, or Kerseymere, a woollen cloth woven as a twill. Its upper surface shows a diagonal rib.

**Ketchup**, or Catsup, a sauce with which soups are flavoured. The ketchups in common use are made from walnuts, mushrooms, or tomatoes.

**Khas-khas.** *See* **Kuskus.**

**Khât**, or Abyssinian tea. The leaves of *Catha edulis*, a large shrub indigenous to East Africa and Arabia, but cultivated chiefly in Yemen. Some is carried to Aden.

**Kid Skins**, used for making gloves (*q.v.*).

**Kidderminster**, a two-ply carpet without a pile. The pattern, which is most distinct on the right side, appears on the wrong side in the other colour. This is the oldest form of machine-made carpet. Union Kidderminster carpets have cotton warps.

**Kieselguhr.** This German name is commonly given to diatomaceous earth, which, saturated with nitro-glycerine, forms dynamite. Its chief use at the present time, however, is as a non-conductor of heat. It is light, is not affected by comparatively high temperatures, and is comparatively cheap. It is used to line blast-furnaces, as jackets for boilers and covers for steampipes, &c., and for these purposes is sometimes made into bricks. Kieselguhr occurs in Scotland and Ireland, at Oberohe in Prussia, near Berlin, in Nova Scotia, the United States, and Australia. In the United Kingdom about 3000 tons are used annually, part obtained from Aberdeenshire, and the rest from Germany and Norway.

**King of Bitters**, a name for **Kreat** (*q.v.*).

**Kingwood**, a beautiful cabinet wood from South America, by some ascribed to a *Triptolomea*, by other authorities to a *Dalbergia*.

**Kino**, the dried sap of several trees, natives of India and Australia, which contains tannic acid, and is therefore a valuable astringent. The best kind is the kino of Malabar, obtained from *Pterocarpus marsupium*. *Butea frondosa* yields the kino of Bengal, and *Eucalyptus resinifera* and other species the kino of Australia. In India the substance is used to dye textiles yellowish-brown (nankeen). See also **Seaside-Grape.**

**Kip**, the hide of a calf or small ox. The small ox-hides from India are also called kips.

**Kippers**, smoked or red herrings, split open.

**Kirschwasser**, a liqueur distilled from cherries. The kernels give it a strong flavour of bitter almonds. It is made chiefly in Switzerland, the Black Forest, and Alsace.

**Kitt Fox**, a grey fox of North America (*Vulpes velox*). The skin is made into fur articles.

**Kittul,** the fibre obtained from the leaves of *Caryota urens*, an Indian palm. Brushes and fishing-lines are made of it. It is also called Indian gut.

**Kohl-rabi** (Ger. *Kohlrübe*), a variety of turnip in which the stem swells out just above the ground. The leaves spring from the enlargement, which is given as food to cattle.

**Kokum Butter,** a fatty matter extracted from the seeds of *Garcinia purpurea*, used in India to adulterate Shea Butter, and in England in the preparation of pomade.

**Kola Nuts,** or Guru Nuts, the seeds of *Sterculia acuminata*, a tree which grows in Africa from the Gambia to Angola and Mozambique, and has been introduced into Mauritius, the West Indies, and South America. The nut is much prized by the natives for its tonic properties, and is imported into Europe, where it is made into chocolate, paste, and aerated water. Containing about 2 per cent. of theine, it certainly acts as a stimulant.

**Kolinski,** the trade name for the skin of the Tatar marten (*Mustela Sibiricus*), brought from Siberia. The tails supply excellent material for artists' brushes; and the fur, reddish yellow in colour, is used as lining, and when dyed, as imitation sable.

**Koumiss,** a fermented beverage made by the Kalmucks from mares' milk. It is now sometimes made in Western Europe, being considered very beneficial to invalids.

**Kousso,** the flowers of an Abyssinian tree (*Brayera anthelmintica*), administered as a vermifuge.

**Kreat,** a very wholesome bitter extracted from the roots and stalks of *Andrographis paniculata*, an Indian plant. *See* **Chiretta.**

**Kümmel,** a liqueur made from corn spirit and flavoured with caraway seeds. It is manufactured in Germany and Russia, particularly in Riga.

**Kundah Oil,** an African name for the oil of *Carapa Guineensis*. *See* **Carapa Nuts.** Also known as Tulicuna oil.

**Kuskus,** the roots of an Indian grass, *Andropogon muricatum*, which are made into mats and screens in India and in Europe, and are laid in drawers because of their perfume. The volatile oil extracted from them is used in perfumery.

**Labanum,** a sweet-smelling resin obtained from the stems of *Cistus Creticus*, *C. Cyprius*, *C. ladaniferus* and other species of rock-rose. The trade is almost confined to the eastern Mediterranean. The leaves of *C. Creticus* and *C. salvifolius* are used in Greece as a substitute for tea.

**Lac,** a substance produced on the twigs of several trees, as *Croton lacciferus*, *Ficus religiosa* and *Indica*, *Zizyphus jujuba* and *Butea frondosa*, by a small insect of the bug sub-order of Hemiptera called *Coccus lacca*. The insects either secrete the lac or produce it by some alteration in the sap of the tree, and envelop themselves in it. The best lac is obtained from the *Zizyphus* and *Butea*, and Bengal and the Irawadi valley supply the best quality. The Ganges valley produces a large quantity, and some is collected in Indo-China and Sumatra. The twigs with the resin still adhering to them is known as *stick-lac*. The resin broken off the twigs is *seed-lac*, and after soaking in water and being squeezed through cloth becomes *shell-lac* or *button-lac*, according as it is allowed to spread out into thin flakes or made into round drops. Lac is used extensively in China and Japan to decorate a number of fancy articles; it forms sealing-wax and French polish and other spirit varnishes; it stiffens the frames of silk hats, and mixed with other substances makes a good cement. In India, chains and bracelets are made of lac. When the lac is steeped, a red colouring matter derived from the bodies of the insects is left in the water. This is boiled down into cakes and is used in dying silk, leather, and cloth. It is very similar to cochineal but not quite so lasting.

**Lace.** Real lace is made entirely with the needle or partly with bobbins. Frequently the foundation is a network on which the pattern is worked, or to which it is sewed, but in some kinds the different parts of the pattern are joined together without any network. In pillow lace the plainer parts are formed by the interlacing of a number of threads wound on bobbins, and are afterwards connected by more delicate needle-work. Needle lace (*point de l'aiguille*) is made at Venice and in Belgium, where also pillow lace (*point duchesse*), called also in France *point d'Angleterre*) is made, as well as at Honiton and other towns in Devonshire. Valenciennes has long been famous for its lace, and Alençon lace (*point de France*) was noted not many years ago, but is no longer manufactured at that town. Silk lace is made at Lyons, Venice, Malta, and elsewhere, and gold and silver lace in Spain. The *ñandino* or "spider's web" of Paraguay is very light and elegant, but at present has a limited sale. Machine-made lace is largely manufactured in many countries, and is an important article of trade. The chief centres of the manufacture are Nottingham, where, however, the industry has declined of late, Calais, St. Gall, Barmen, and other towns in Germany. Silk, cotton, and a mixture of materials are worked up, and Chantilly, Maltese, Valenciennes, Venetian, and other varieties of real lace are imitated.

**Lacquer.** The lacquer applied to metal ware and some articles of furniture is a mixture composed chiefly of shellac dissolved in spirits of wine, to which a small quantity of gum-resin is added, and which is coloured by gamboge and other substances. The lacquer on Japanese lacquer-ware is the juice of *Rhus vernicifera*, which is laid in numerous coatings on the surface to be decorated. For gold and silver lacquer powder of these metals is added.

**Lamb Skins.** Used instead of kid in the fabrication of gloves. South Russia, Greece, and Hungary supply the best qualities.

**Lametta.** Foil or wire of metal, especially copper.

**Lampblack,** the soot produced by burning petroleum, tar, or any cheap oil in a limited volume of air. The soot is afterwards freed from the admixture of tar by heating, and sometimes soda is also employed to purify it. Lampblack is the important constituent of Indian ink and printing ink, and is used in colouring some kinds of leather.

**Lancewood,** the tough and pliant wood of *Guatteria virgata* (order Anonaceæ) is the true lancewood of commerce. Moulmein lancewood is furnished by *Pavetta Indica*, a Cinchonacea, and Australian by *Backhousia Australis*, a myrtaceous tree.

**Lanka,** a tobacco grown in the Godavari delta, Madras, and named after an island in the river.

**Lanoline,** a greasy substance extracted from the oil of sheep's wool, and used for ointments, pomades, soap, &c.

**Larch.** The common larch (*Abies larix*) grows in south and middle Europe and yields a useful timber. The resin obtained from the larch in Siberia is known as Orenburg gum, and a manna collected in France is called Briançon manna. The timber of the American larch, Tamarack or Hackmatack, is highly valued.

**Lard,** the fat of swine rendered down. A considerable quantity is manufactured in Hungary and Servia, but the industry is enormously developed in the United States, especially at Cincinnati and Chicago. Leaf lard is made from the superfluous fat which accumulates round the kidneys and other parts of the pig and is rendered down in an open kettle, while steam lard is made from all parts of the animal, and is rendered down in closed cylinders; it is then refined in steam-jacketed kettles. Formerly lard was used only in cooking and to a small extent in the preparation of ointments. Now, however, a large quantity of neutral lard, or oil, is made, chiefly from leaf lard, for the preparation of margarine. Stearine pressed out of lard is made into candles, and another ingredient, oleine, is sold as a lubricant under the name of "lard oil"; sometimes it is also used for the adulteration of salad oil.

**Larks.** Larks are caged and netted in Germany for the table, and many are exported to France and Great Britain.

**Lastings,** a strong, hard cloth used for ladies' boots, &c.

**Latakia,** a Turkish tobacco which grows on the hills near the seaport Latakia in Syria.

**Latten,** a thin sheet of metal, strictly of brass, but the term is commonly applied to sheets of tin, iron, &c.

**Laudanum.** Tincture of opium (*q.v.*).

**Lavender.** The flowers of *Lavandula vera* are gathered for the sake of their perfume, and an oil is extracted from them. On the continent of Europe the wild lavender is collected, but in England the plant is cultivated, especially near Mitcham, Surrey, and Hitchin, Hertfordshire, and the oil distilled from these flowers is of superior quality. In Southern France oil is also obtained from *L. latifolia*, or *spica*, but it is less odorous. It is called oil of spike, and is chiefly used by painters on porcelain and in the composition of varnishes.

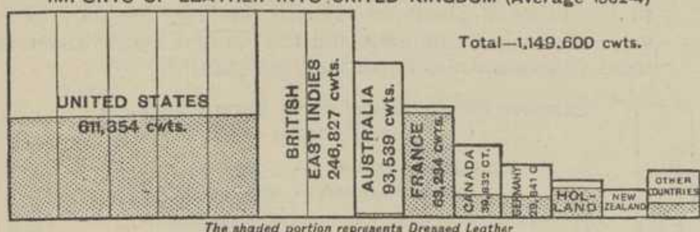
**Lawn,** a fine linen cambric, made chiefly in Belfast.

**Lead.** *See* Plate 145.

**Leather.** Hides (*q.v.*) are delivered to the tanneries in a fresh condition, salted, or salted and dried. The first process is to remove all hair, grease, and other impurities, which is effected by steeping the hides in lime-water, or by heating them (sweating) till putrefaction sets in, when the hair can be easily scraped off. The hides are then tanned, being laid in pits filled with solutions of tanning materials (*q.v.*). They are first immersed in a weak solution, and are transferred to other pits where the solution is stronger. They are then dried, oiled, worked over with a steel striking pin and rolled. A whole hide is called a *crop*, half of which, cut longitudinally, is a *side*. The central nearly rectangular part, when the shank pieces, checks, &c., have been removed, is known as a *butt*, and half a butt is a *bend*. The small pieces cut off are known as the offal. Dressing leather consists in a series of operations intended to adapt the leather for the various uses to which it may be applied. The flesh side is pared down to make it smooth and to make the leather of the same thickness throughout. Some hides are also split into two or more layers. Tallow and cod-liver oil are applied to soften the leather and render it flexible. Tawing is dressing leather with certain mineral salts. Glove leathers and the top leathers of ladies' boots are tawed. Shamoying is working oil into the skin. *See* **Buckskin.** Morocco leather

used to be made of goat-skins tanned in sumach, but split calf-skins and sheep-skins are now largely used. Russia leather is now any thin smooth leather impregnated with oil of birch bark. In Russia calf-skins only used to be employed in its manufacture.

IMPORTS OF LEATHER INTO UNITED KINGDOM (Average 1902-4)




*The shaded portion represents Dressed Leather*

**Leathercloth,** or American cloth, a textile fabric, usually unbleached calico, on which a paste of boiled oil, pigments, driers, and other ingredients is laid with a roller. Linoleum cement is also used, and gelatine rendered insoluble by some chemical agent. Varnish renders it more durable.

**Lemon Grass.** *See* **Grass Oils.**

**Lemons.** The lemon (*Citrus limonum*), a small tree of the same natural order as the orange, is cultivated in Mediterranean countries and in the East and West Indies and southern United States. Besides fresh fruit, the expressed juice is exported, and the dried peel is used in making liqueurs. From the juice citric acid is extracted, and the peel yields a volatile oil, or essence of lemons, much used in perfumery. Sicily and Calabria are the chief sources of essence. Salts of lemon are binoxalate of potash. They exist in many plants, but are now obtained from sawdust. Salts of sorrel is another name for them. Nearly 100,000 cwts. of lemons (£400,000) are imported annually into the United Kingdom, chiefly from Spain and Italy.

**Lentils,** a leguminous plant, cultivated in southern Germany, the borders of the Mediterranean, and in the East Indies. There are several varieties, the small brown seeds being most esteemed. The annual imports into the United Kingdom are about, on an average, 176,000 cwts., worth about £52,000.

**Leopard.** The leopard (*Felis pardus*) is found in all parts of Africa and in Central Asia and India. Leopard skins are articles of trade.

**Letterwood,** snakewood or leopardwood, a beautifully marked wood from the West Indies and Guiana. It is the heartwood of several kinds of tree, *Brosimum aubletii*, *Piratinera Guianensis*, *Machærium Schomburgkii*, &c. It is used for walking-sticks, and for bows, being very elastic; some kinds are also used in veneering.

**Licorice.** The licorice plant, *Glycyrrhiza glabra*, grows in the south of Europe chiefly, though it is to a small extent cultivated even in England (Yorkshire). The prickly licorice (*G. echinata*) is cultivated in Italy, Sicily, Russia, and the East. Turkey, Spain, and Italy export the largest quantities, and from the latter two countries large quantities of the inspissated juice, known as Spanish juice, are sent into the market. Licorice is used in medicine, by porter brewers, and by tobacco manufacturers. The average imports into the United Kingdom are about 25,000 cwts. (£56,000).

**Lign Aloes,** a contraction for Lignum Aloes, called also eagle-wood. The heartwood of *Aquilaria ovata* and *agalocha*, which is burnt in the East as incense. The trees grow in Further India and the Malay Archipelago.

**Lignite.** This term is generally used as synonymous with brown coal, but it strictly signifies bituminous wood in which the branches, bark, and rings are still visible, whereas brown coal denotes all the coal of Tertiary age. Brown coal is widely distributed, and is especially abundant in the Oligocene rocks of Germany, Austria, Bohemia, and Hungary. It is also found in the upper Missouri valley and Vancouver Island, in the East Indies and Japan. It is well suited for briquettes, and is the source of the umber of Cologne. A very important use is as a source of mineral oil and paraffin. *See* also **Coal.**

**Lignum Vitæ.** *See* **Guaiacum.**

**Lima Wood,** a name for Pernambuco wood. *See* **Brazil Wood.**

**Lime.** Oxide of calcium, obtained by burning chalk, limestone, or other forms of carbonate of lime. Quicklime enters into combination with water, forming slaked lime, a light white powder. A solution of this in water is the lime juice employed in medicine, and when the lime is mixed with a large excess of water it is called milk of lime, and is used as whitewash. Lime is an ingredient of mortar and of plate and sheet glass, is used to purify gas, to remove the hair from hides, and for many other industrial purposes. Chloride of lime is a well-known bleaching powder and sanitary agent. Sulphate of lime is gypsum; and phosphate of lime is the chief constituent of bone earth, commonly used as a manure. Acetate of lime is used in dyeing with Turkey red, and to render materials uninflammable.

**Lime.** The fruit of *Citrus limetta*, a tree allied to the orange and lemon. It is a native of the East, but is now grown in the West Indies, and in southern Europe. The variety known as Adam's Apple is especially the production of Corfu. Like lemons, limes yield an antiscorbutic juice, and the peel is candied. *See* also **Bergamot.**

**Linen.** A fabric originally made entirely of flax, but now frequently of a mixture of flax and hemp or jute. The preparation of the fibre is laborious, and flax cannot be so easily spun as cotton, because all the gum cannot be removed from the fibre, and therefore linen is a dear material, and in spite of its greater strength and glossiness is less in demand than it used to be. For fine kinds of linen goods the handloom is still employed, the want of elasticity in flax rendering it difficult to weave in powerlooms. Damasks, towelling, upholstery linen, canvas, sacking and sailcloth, table-cloths, shirtings, and fine lawn and cambric handkerchiefs are made of flax, often with an admixture of other materials. The great linen manufacturing country is the United Kingdom, especially Ireland, in Belfast and the neighbourhood. Germany takes the second place, Bielefeld and Osnabrück producing fine qualities. Bohemian linen has also a good reputation. France and Belgium manufacture fairly large quantities. In the United States flax is grown chiefly for its seeds.

**Ling,** *Molva vulgaris*, a fish of the family Gadidæ, which lives in the seas of northern Europe. Large numbers are caught, and are salted and dried.

**Linoleum.** A floor-cloth made of powdered cork, oxidised linseed oil, and resin. A cement is first made of oxidised oil, common resin, and Kauri resin heated in a closed pan. To this the cork is added and colouring materials (ochre and oxide of iron), and the mixture is spread over canvas by heated rollers. A pattern is printed on the surface of the linoleum. In some kinds, however, the pattern is formed by pieces cut out of sheets of different colours and cemented on to a canvas back. In cork carpet, the particles of cork are larger and no pigment is added.

**Linseed.** The seeds of the flax plant are exported in very large quantities from India. Russia also, the Argentine Republic, and the United States export these grains. They yield, when pressed cold, about 20 per cent. of an almost colourless oil, and when heated 25 to 28 per cent. of an amber-coloured oil. Linseed oil is used in mixing paints and varnishes, in oilcloth, &c. Boiled oil, especially when mixed with litharge, white lead, or sulphate of zinc, dries more quickly than cold-drawn oil. The seeds from which the oil has been extracted is ground into meal or compressed into oilcake (*q.v.*) and given as food to cattle.

**Lint.** Linen shredded down into a soft material for dressing wounds. It is now superseded by cotton cloth, fluffy on one side, woven for the purpose. Cotton lint is the downy fibre from the seeds of the cotton.

**Liqueurs.** Alcoholic drinks thickened with syrup of sugar and flavoured with various aromatic substances. The most noted is Chartreuse, which is made by the distillation of certain aromatic plants in good grape brandy. The liqueurs made in other monasteries, Benedictine, Trappistine, &c., have also a good reputation. Besides these, there are anisette, flavoured with aniseed; Curaçoa, made from unripe bitter oranges; Kümmel, flavoured with caraway seeds; Maraschino, distilled from bruised Marasca cherries; Noyau, which owes its flavour to bitter almonds, and Kirschwasser, several of which are described under separate headings. France is the chief manufacturing country, and Cassis, a liqueur made from black currants, is essentially a French production. Paris and Lyons produce various kinds of liqueur; Bordeaux is noted for its anisette, Marseilles for its absinthe, and Dijon for its cassis. Curaçoa is made at Amsterdam, Kümmel at Riga and Berlin, Maraschino in Dalmatia and Austria. About 17,000 gallons of liqueurs are imported annually to the value of £27,600, France supplying more than half.

**Liquidambar.** A balsam which exudes from the bark of *L. styraciflua*, a native of the United States and Mexico. Another species, *L. orientale*, grows in southern Asia Minor and Syria, and also yields a liquid balsam in abundance which is said to be the liquid storax of the Levant. This balsam is used by druggists and perfumers.

**Liquorice.** *See* **Licorice.**

**Litchi,** or Lychee. The fruit of *Nephelium Litchi*, a tree of the order Sapindaceæ, which grows in China, Cochin-China, and the Malay Archipelago. *N. Cappaceum* of the Malay Peninsula and Archipelago, and *N. longanum* of southern China, also bear fruits which are eaten in those countries.

**Litharge.** *See* **Lead** (Plate 145).

**Lithium.** The lightest metal known. It occurs in small quantities in Sweden, Cornwall, the United States, &c. The carbonate of lithia is frequently used in medicine, in the form of tablets or in aerated water.

**Lithofracteur.** An explosive composed of coal dust, sodium nitrate, sulphur, sand, and nitro-glycerine.

*h*

**Lithographic Stones.** These fine-grained stones, composed of lime, clay, and siliceous earth, are found in many countries, both in Europe and North America, but the best are obtained from the quarries of Solnhofen in Bavaria. They are cut in slabs 2 to 5 inches thick, and are buff or bluish grey in colour.

**Litmus.** A colouring matter prepared from several lichens, particularly *Lecanora tartarea*. It dyes mauve, and is used to make litmus paper, a valuable test for acids.

**Llama.** A South American ruminant (*Auchenia lama*) of the camel family. The hair is rougher than alpaca, but is likewise mixed with wool for the manufacture of cloth. The average imports of llama, alpaca, and vicuña wool in 1902–4 were about 5,560,000 lbs., valued at £300,400.

**Lobster.** The common lobster (*Homarus vulgaris*) is caught in the seas of northern Europe. The American lobster (*H. Americanus*) is caught off the coasts of Nova Scotia and New Brunswick and the northern states of America, and is tinned and exported. A third species (*H. Capensis*), found at the Cape of Good Hope, has smaller claws. The Norway lobster (*Nephops Norvegicus*) is preferred by some connoisseurs to the common lobster, while the spiny lobster (*Palinurus vulgaris*) is undoubtedly inferior.

**Locust Tree.** The thorn-acacia (*Robinia pseudacacia*), a native of North America, and now cultivated in many temperate countries, yields a strong tough wood, called locust wood. Another kind of locust wood is furnished by *Hymenæa courbaril*, a large tree growing in the West Indies and South America. It is turned to many purposes in America, and small quantities are exported to Europe. This tree also yields the greater part of the South American copal.

**Logwood.** The heart-wood of *Hæmatoxylon Campechianum*, a tree of the order Leguminosæ, which grows in the West Indies and Central America. Hæmatein, a reddish-brown colouring matter, is extracted from it, and is used to produce purple, blue, lavender, &c. Extracts of logwood are also made for the use of dyers. The wood also enters into the composition of some inks.

**Longan.** The fruit of *Nephelium longanum*, smaller than the Litchi (*q.v.*), which is a favourite fruit in China, and is also exported.

**Long Pepper.** The fruit of *Chavica Roxburghii*, or *Piper longum*, which is cultivated in India and the Malay Archipelago. It is used in the East as a stimulant.

**Loofah.** The fibrous part of the fruit of certain Cucurbitaceæ. The best is from the Egyptian *Luffa Ægyptiaca*, and is used as sponges, and in socks and baskets.

**Loquat.** This fruit is borne by *Eriobotrya Japonica*, a tree of the order Rosaceæ and closely allied to the medlar.

**Lotus.** *See* **Date Plums** and **Jujube.**

**Loxa Bark.** Peruvian bark of superior quality from the province Loxa in Ecuador.

**Lucerne,** a papilionaceous plant allied to clover. Black Medick (*Medicago lupulina*) and *M. sativa* are grown for fodder, especially in North and South America.

**Lucifer Matches.** Matches dipped in chlorate of potash and sulphide of antimony and ignited on sandpaper. They are not much used now.

**Lucraban.** An oil of uncertain origin exported from Siam. It is said to be obtained from the seeds of *Hydnocarpus venenata*. Like Chaulmugra oil, it is a remedy for skin diseases.

**Lumbang,** or Lambang, a name for candle-nuts (*q.v.*).

**Lunka.** *See* **Lanka.**

**Lupine.** The yellow and blue lupine (*Lupinus luteus* and *L. angustifolius*) are grown as food for cattle. The seeds, as also those of *L. albus* and the Egyptian lupine (*L. thermis*) are also eaten by human beings, and are cultivated in Mediterranean countries for that purpose. They are also made into a substitute for coffee.

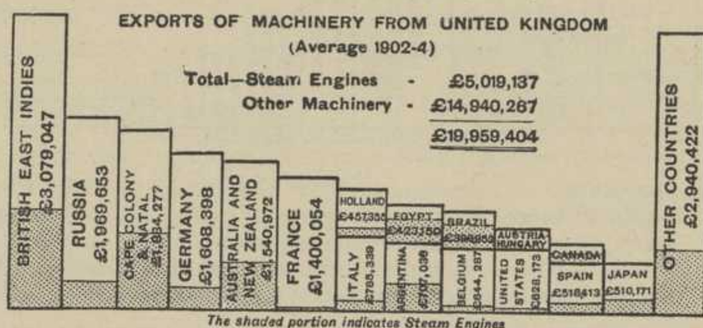
**Lycopodium.** The spores of this cryptogam (*L. clavatum* or stag's-horn moss, *L. selago*, &c.) are used for coating pills, in fireworks, &c. The former acts as an emetic and the latter as a cathartic. A dye is obtained from *L. alpinum*.

**Lynx.** Several species of lynx are hunted for their skins. *L. virgatus* inhabits the mountainous and wooded districts of Eastern Europe and Asia. Other Asiatic species are the Caracal and Tibetan lynxes. The most esteemed skins are those of the North American lynx (*L. Canadensis* or *borealis*), which are exported from Hudson Bay.

**Macaroni.** A paste of hard wheat-flour, frequently coloured with turmeric or saffron, and pressed through holes into various forms. When in long thick tubes it is called macaroni; thin pipes are known as vermicelli, and small pieces of various forms as Italian paste. Macaroni is made chiefly in Italy (Naples, Leghorn, Genoa, and Turin), and in the Auvergne, France. When the meal has not sufficient glutinous matter white of egg is mixed with it.

**Mace.** The fleshy covering of the nutmeg. It is dried and exported from Penang, Singapore, and other places in the East Indies, and is used as a spice. *See* **Nutmeg.**

**Machinery.** Machinery includes locomotives, agricultural and other engines, other agricultural machines, machinery for textile industries, mining, &c. Great Britain exports machinery to the value of about 20 millions sterling, Germany to the value of nearly 10 millions, and the United States about the same. Germany also imports a large quantity.



*The shaded portion indicates Steam Engines*

**Mackerel.** A fish of the family Scomberidæ, which includes the Tunny and Bonito. The common mackerel (*Scomber scomber*) is found as far south as the Canary Islands, and an American species as far as Cape Cod on the Atlantic coast of America, and the fish occurs also in the Mediterranean and in the Southern Hemisphere. It is caught in great numbers in the seas of Northern Europe, and is much esteemed as food, but it soon loses its flavour when kept. It is eaten salted and smoked as well as fresh.

**Madapolams,** a fine longcloth, named after a village in the Madras Presidency, India, but now exported from Europe to the East.

**Madder,** the genus Rubia is found in the tropical and warmer temperate climates of the world. The roots of *R. peregrina* are exported from the Levant, Greece, and Sicily. Next in quality is the madder of France (Avignon), and of Alsace and Holland (*R. tinctorum*). The Indian madder, or munjeet, is *R. munjista* or *cordifolia*. Other species grow in America, and are also used in dyeing reds and purples. The roots contain a principle called alizarine, which is now obtained artificially, and hence madder, though much more durable than the artificial product, is less in demand. An extract called garrancine is made of it.

**Madeira,** a much-esteemed brown wine, made from a mixture of black and white grapes, in the island of Madeira. There are two kinds of dry Madeira, known as Sercial and Boal.

**Magilp,** or Megilp, a varnish of linseed oil and mastic, used by artists. Robertson's medium, which dries quicker, is now more frequently used.

**Magnesia.** Magnesium occurs in dolomite, which is a mixture of carbonate of calcium and magnesium, and also in magnesite, a carbonate occurring in several European countries, Canada, the United States, and India. Magnesite is used for the manufacture of carbon-dioxide gas, and when calcined for lining furnaces, and in paper-making. Wires of the pure metal are used to give light in signalling and in photography. In medicine the carbonate is used in the form of fluid magnesia, and also the sulphate, known as Epsom salts, which is present in the water of many mineral springs, and is made from magnesite. Citrate of magnesia is a mixture of bicarbonate of soda, a little Epsom salts, citric and tartaric acids.

**Maguey,** a name in Central America for the agave.

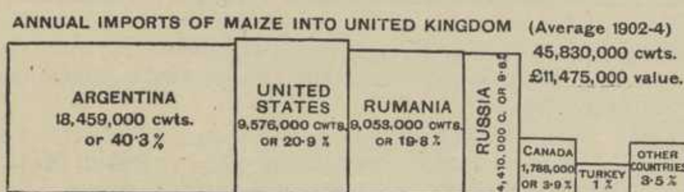
**Mahaleb.** *See* **Cherry.**

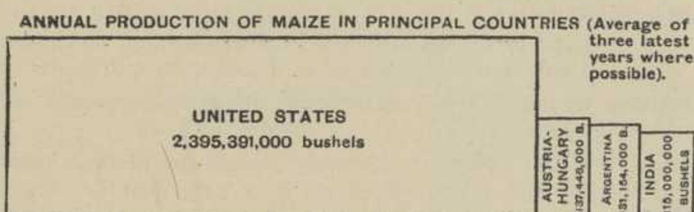
**Mahogany,** the wood of *Swietenia mahogani*, a tree of the order Cedrelaceæ, which grows in the West Indies and Central America. The hardest and most beautifully grained comes from the islands, and is called Spanish mahogany. Jamaica yields the best quality, but the supply is now small. Large quantities of a plainer grain are obtained from Central America, and this timber is called Honduras mahogany. African mahogany is the wood of *Khaya Senegalensis*, and East Indian of the Rohuna tree, *Soymida febrifuga*, both of the same order. *See* Plate 158.

**Mahwa Flowers,** the sweet flowers of the butter-tree (*Bassia latifolia*), *q.v.*, which are eaten in India, and from which a spirit is distilled. They have been imported into Europe.

**Maize.** The *Zea mais* (Indian corn, Turkish wheat) is a cereal grown extensively in the warmer parts of America, from 50° N. lat. to 30° S. lat., and to a height of more than 6000 feet within the tropics. Introduced into Europe by Columbus, it is now grown in Southern Europe and parts of Africa, in Australia, especially Queensland, and in the southern parts of Asia, where, indeed, it seems to have been known in ancient times. It requires a high summer temperature, abundant moisture, and a deep and rich soil. Owing therefore to the dryness of the climate of North Africa, little is grown there. Maize is very extensively eaten in Italy in the form of polenta,

and is common in the south-west of France, in the Balkan States, and the Caucasus. Much more abundant is it in North America, where it is called simply corn, and where nearly four times as much maize is raised as wheat. Coarsely ground it forms the hominy of the Southern States, and the whole grain with the cuticle removed is known as hulled grain. Pop-corn is maize grains parched over a quick fire, and coated with syrup. Maize is not easily made into bread owing to its deficiency of gluten, but johnny cakes made of it are a favourite food. The young ears, green corn, are eaten as a vegetable, and are tinned in some States. At the Cape the ears of maize are called mealies. Maize is also put to many other uses. It is grown for fodder, especially in those countries where the summer temperature is too low to properly ripen the grain. Starch is made from it, and this, by the addition of acid, is converted into glucose. Syrup from the stem yields a sugar, and by distillation an excellent spirit. The stalks serve for thatch and fuel, and the fibres are spun into a durable yarn. An oil also is extracted from the grains which is used in industries. The straw is a material used in paper-making. The world's crop is about 3185 million bushels, of which the United States produces nearly three-fourths. The largest crop of this country was harvested in 1905, and amounted to more than 2625 million bushels.




**Maizena,** American corn-flour made from maize.

**Malacca Cane.** *See* **Rattan.**

**Malachite,** a green carbonate of copper, an ore found in several countries, and in especially fine specimens in Siberia and the Urals (Nizhne-Tagilsk), and in Australia. It is made into vases, tables, &c., and is frequently inlaid in marble.

**Malaga,** or Mountain. A rich wine exported from Malaga in Spain.

**Malagueta Pepper.** *See* **Grains of Paradise.**

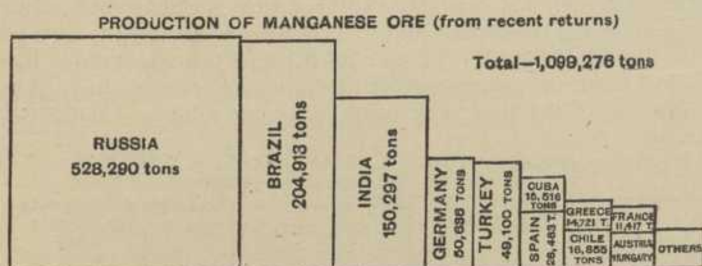
**Malambo Bark.** The aromatic bark of *Croton Malambo*, used in America for medicinal purposes. *See* **Croton.**

**Malt,** barley grains steeped in water and heated on a malting floor for about ten days, until the leaflets of the germ begin to appear, when they are dried in a kiln. The barley has now attained its greatest capacity for producing sugar, and is used in the manufacture of beer and spirits. *See* also **Beer.**

**Maltine,** a malt extract prepared for invalids.

**Mandarin Oranges.** *See* **Oranges** (Plate 100).

**Manganese,** a whitish grey metal, the oxides of which are largely employed in manufactures. The most important ore is the black oxide, known as pyrolusite. Less common are manganite, braunite, and other oxides. Very frequently it occurs in association with other metals—silver, zinc, and especially iron. Ores of manganese are extracted in many countries, but are mined in the largest quantities in Russia, India, and Brazil. The metal is largely used in the manufacture of steel, in colouring glass and dyeing textiles, and in the composition of bronzes. A very important use of it is in the production of chlorine. The manganates and permanganates of potash are valuable disinfectants. Rhodonite, a manganese silicate of a beautiful rose colour, is found in Russia and at Franklin Furnace, New Jersey, and is used as an ornamental stone.




**Mango,** the delicious fruit of *Mangifera Indica*, of the order Anacardaceæ, now cultivated in the West Indies and Central America, and in tropical Africa, as well as in the East Indies. There are several varieties, some of which are less esteemed because the fruits are fibrous or taste of turpentine; a much esteemed variety is known as No. 11. The wood of the Mango is used in India, and a gum is obtained from the bark, and gallic acid from the seeds.

**Mangold Wurzel.** *See* **Beet-root.**

**Mangosteen,** an excellent fruit borne by *Garcinia mangostana*, of the order Clusiaceæ, a tree that grows in the Malay Peninsula and Archipelago. The pericarp contains a large quantity of tannin, and is a good medicine in cases of dysentery and diarrhœa.

**Mangrove.** The bark of several species of *Rhizophora* are used in tanning. The fruit of the common mangrove (*R. mangle*) is edible, and the fermented juice is a pleasant light wine.

**Manila Hemp,** the fibre from the leaf-stalks of *Musa textilis*, a plantain which thrives best in the Philippines. It is made into ropes and matting. The production of manila is about 66,000 tons.

**Manilas.** Cigars and cheroots made in the Philippine Islands.

**Manioc,** a shrubby plant of tropical America, cultivated also in other tropical countries. *See* **Cassava.**

**Manna,** a saccharine exudation from the trunk of *Fraxinus ornus*, an ash cultivated in the south of Europe. It is exported chiefly from Sicily and Calabria. Manna is a gentle purgative. In Kurdistan, Persia, and Mesopotamia a manna is obtained from oaks, tamarisks, &c., and is eaten as a sweetmeat, and an exudation from *Eucalyptus mannifera* is a favourite sweetmeat with the children of Australia.

**Maple.** The wood of the common maple (*Acer campestre*) is fine-grained and takes a high polish, and is therefore much used by turners. The sycamore also (*A. pseudoplatanus*) yields a white compact wood. Another important species is the sugar maple (*A. saccharinum*) of North America. In Canada sugar is obtained from it for domestic use, and a kind of molasses superior to that of the sugar-cane. The wood has a satiny appearance, and when finely marked is the bird's-eye maple of cabinet-makers. Species of maple grow also in the Himalayas and Japan.

**Marabou Feathers,** the under feathers of the tail of the adjutant, a stork-like bird which is a native of India (*Leptoptilus argala*) and of Africa (*L. crumenifer*).

**Maraschino,** a liqueur made of a kind of a sour cherry, marasca, cultivated chiefly in Dalmatia. Zara in Dalmatia is a noted seat of the manufacture, but good maraschino is produced also in Trieste, Vienna, Pest, and Graz. *See* **Liqueurs.**

**Marble.** The term, strictly applied, denotes a crystallized carbonate of lime with a saccharoidal fracture, but is frequently extended to include all limestone rocks capable of being polished. Statuary marble is fine-grained, homogeneous, of a uniform colour, and not liable to splinter. The most noted is the white marble of Carrara and Massa in Italy. A kind not quite so excellent is quarried in Saint Béat in the Pyrenees. In these mountains, in the north of Italy, in the Alps, Jura and Vosges mountains coloured and veined marbles of various kinds are quarried. Many limestones are beautifully marked by the fossil shells they contain, and are used for decorative purposes.

**Margarine,** or butterine, a substitute for butter, composed of neutral lard and oleo-oil with the addition of some butter, cream, or milk. In the highest grade butter is used, in the medium cream and milk, and in the lowest milk. In the last, cotton-seed oil or some other vegetable oil is often substituted for part of the neutral lard and oleo-oil. The quality depends greatly on the care with which the ingredients are amalgamated, and the temperature at different stages of the process. The greatest producers of margarine are Germany and the Netherlands, and the United States come next in order. The average imports into the United Kingdom in 1902–4 were 936,190 cwts. (£2,459,196), mostly from Holland.

**Marjoram.** Oil of marjoram is obtained from *Origanum vulgare* and other species, and is used as a liniment by farriers. This and thyme oil are frequently sold under the same name.

**Marking Nuts,** the seeds of *Semecarpus anacardium*, so named because the juice of the hard outer shell can be used as marking-ink. *See* also **Varnish.**

**Marmalade.** *See* **Orange.**

**Marmot,** the Alpine marmot (*Arctomys marmotta*) of Europe and the American marmots, popularly called woodchucks, yield furs of some value.

**Marsala.** A brown wine grown in the west of Sicily and shipped at the port of Marsala.

**Marten,** a genus of small carnivorous animals closely allied to the weasels. The fur is much esteemed, the most valuable being that of the sable (*q.v.*). The pine marten, *Mustela martes*, and the common marten, *M. foina*, also yield good furs. *See* also **Kolinski.** North American sable or marten is the fur of *M. Americana*, closely resembling the pine marten. The Pekan, Fisher, or Pennant's marten, *M. Pennantii*, is a large variety, and is called by hunters "black fox."

**Massicot.** *See* **Lead** (Plate 148).

**Massoy Bark,** or Missoy. The bark of a species of Cinnamon, *C. Burmanni*, var. *Kiamis*, which grows in New Guinea and the neighbouring islands.

**Mastic,** a gum resin derived from *Pistacia lentiscus*, which grows in Mediterranean lands, and especially in the island of Chios. It is used by dentists and in the preparation of the almost colourless varnish with which paintings are often protected. The wood is used in inlaying, and in Algeria a tanning extract is prepared from the leaves. Several cements for china, marble, metals, &c., are also called mastics. They are made of various materials—gum-resins, white of egg, bullock's blood, litharge, chalk, zinc, and other metals.

**Matches.** After the small chips of wood, or splints, have been soaked in paraffin to render them more combustible, their ends are dipped in an igniting composition, consisting principally of phosphorus and chlorate of potash or lead dioxide. For safety matches the composition is made of chlorate of potash and sulphide of antimony cemented with glue, and the rubbing surface is coated with phosphorus and antimony. Of late matches have been made with hyposulphite of lead instead of phosphorus, the latter being injurious to the health of the workmen. In vestas bits of stearin tapers take the place of the wooden splints. Vesuvians have a large head composed of slow-burning material, such as charcoal, saltpetre, &c. The abundance of wood in Norway and Sweden has given rise to a large manufacture of matches. Jönköping is an important seat of the manufacture. In France, including Corsica, the manufacture is a government monopoly.

**Maté.** Yerba maté, or Paraguay tea, grows in Paraguay, in the province of Missiones, Argentina, and in the southern provinces of Brazil—Matto Grosso, Santa Catharina, Rio Grande do Sul, and Parana, between latitudes 22° and 29°, and eastward to the Serra do Mar. The tea is the leaves and twigs of a species of holly, *Ilex Paraguayensis*, and owes its stimulating property to an alkaloid very similar to caffeine. The consumption of maté is increasing in South America, but efforts to introduce it into Europe have hitherto failed. The crop of the year may be estimated at nearly 100,000 tons.

**Matico,** the hairy leaves of a kind of pepper *Artanthe elongata*, which grows in the damp forests of Peru, Brazil, and Panama. They are used as a styptic. The leaves of *Eupatorium glutinosum* of Quito are also known as matico.

**Mats.** Mats and matting are made in many countries and of various materials. In Russia they are woven of lime-tree bast, in East Prussia of rushes, in France of straw, and in Spain of esparto grass and reeds. Coir and jute are commonly used materials. Chinese and India mats are among the most important as articles of trade. The former are composed of the fibres of *Arundo mitis*, and some of them from the fibres of *Cyperus tegetiformis*. In India palms and other fibres are used. The best are made at Midnapur, cheaper articles at Hoogly. Travancore mats are made of *C. textilis*.

**Maw Seed,** a name given to the seeds of the opium poppy (*Papaver somniferum*) when sold as food for caged birds.

**Mead,** a fermented drink made of honey and water to which spices are sometimes added. It is still consumed by Russians, Poles, and Scandinavians, and a drink is also made from honey in Northern Asia, Ethiopia, Madagascar, and South Africa.

**Meat.** *See* Plate 65.

**Medlar,** the common medlar, *Mespilus germanica*, is a small tree bearing a small roundish fruit, which is hard and sour until it becomes soft and brown by decay. Several varieties are cultivated in France, Italy, and Germany.

**Médoc.** Some of the best clarets are grown in the Médoc peninsula between the Gironde and the Bay of Biscay. The name Médoc, however, is generally given to the lighter clarets of the district.

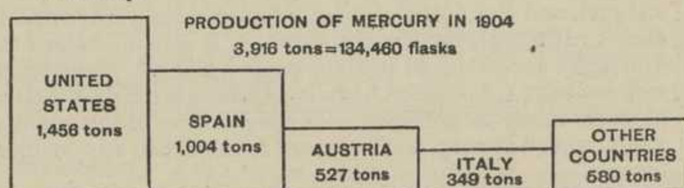
**Meerschaum,** hydrated silicate of magnesia or sepiolite, occurring in many European countries. The best quality, however, is found in the neighbourhood of Eskishehr in Asia Minor, and is exported from Brussa to Europe and North America to the annual value of about £52,000. In Paris and Nuremberg meerschaum pipes and other articles are manufactured, but the great seat of the industry is Vienna, where 100,000 pipes are turned out annually. Various compositions are made resembling closely the real meerschaum. The best of these consists of meerschaum waste mixed with kaolin or some other siliceous earth.

**Melons.** The musk melon, *Cucumis melo*, originally a native of the East, is cultivated in the southern countries of Europe, in North Africa, and America. It is imported from Portugal and Spain, and also the water melon, *C. citrullus*, which attains an enormous size in the southern States of North America.

**Menhaden,** a fish of the herring family (*Brevoortia tyrannus*) caught off the Atlantic coast of the United States for the sake of its oil.

**Menthol.** *See* **Mint.**

**Mercury,** or Quicksilver. The most common ore of mercury is cinnabar (sulphide of mercury), which is mined chiefly at Almaden in Spain, Idria in Carniola, at New Almaden, and other places in California, where the ore contains a very large percentage of pure metal. It is greatly in demand for silver mining, as it forms an amalgam with silver and thus facilitates the separation of the metal from the ore. Amalgams of mercury are also used in gilding and silvering and in stopping teeth. Pure quicksilver is employed in the construction of barometers, thermometers, and other scientific instruments. In medicine the forms most employed are the sub-chloride, called calomel, and white precipitate (a chloride of mercury and ammonium), and the chloride (corrosive sublimate) is a valuable disinfectant and preservative. The pigment vermilion is the sulphide, or cinnabar, above mentioned, but is often prepared by combining the sulphur and mercury in the laboratory. In 1902–4 the average imports into the United Kingdom were 2,532,440 lbs. (£289,297). The greater part came from Spain and Italy.




**Merino,** a breed of sheep formerly confined to Spain, but now bred chiefly in Australia and South America. Its wool is exceedingly fine and silky.

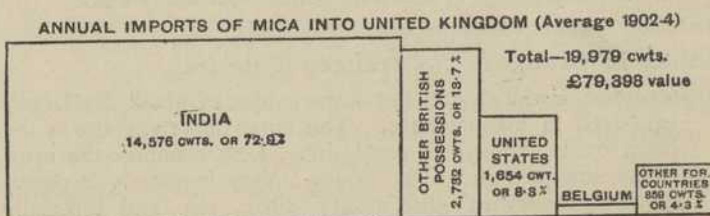
**Metals.** These are described under their separate names. For bell-metal, gun-metal, &c., *see* **Alloys.** *See* also **Dutch Metal** and **Yellow Metal.**

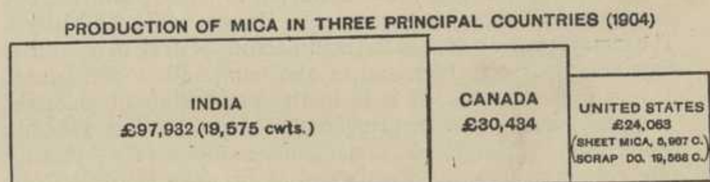
**Methylated Spirits,** a mixture of nine parts of alcohol with one of pyroxylic or wood spirit, sold for manufacturing and industrial purposes and the preservation of zoological specimens.

**Mexican Grass.** Agave or bromelia brushwood exported for brush-making.

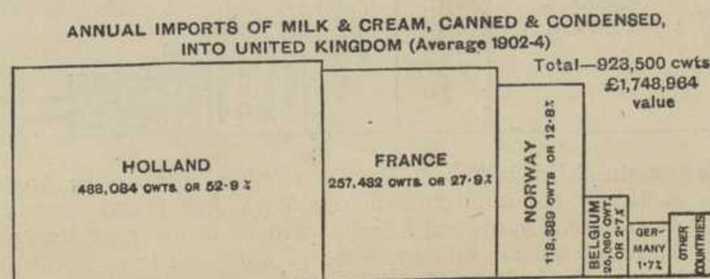
**Mezquite Gum.** *Prosopis glandulosa*, a small tree of the Mimosæ sub-order, and other species, yields a large quantity of gum similar to gum arabic. About 74 tons are collected annually in the southern States of Mexico, much of which is sent to the United States, where, like chicle gum, it is used for chewing.

**Mica.** The most useful kind of mica is potash mica, a silicate of alumina and potash, called muscovy glass in Russia, where it is used for windows, and hence called by mineralogists, muscovite. Other forms are phlogopite, or magnesian mica, biotite, lepidolite, &c. It is found in large plates in Siberia, especially in the neighbourhood of Lake Baikal, in Burma, and in the mica mines of North Carolina. Canada, India, and the United States produce large quantities. The plates are used for lanterns, the fronts of stoves, &c., being bad conductors of heat, and the small flakes and cuttings are ground down to give a gloss to wall-paper, but its most important application at the present day is as an electrical insulator. Thin films are now cemented together into sheets, known as micanite. Talc (*q.v.*) is used for many of the same purposes.




**Milk.** International commerce in this article is chiefly confined to canned and condensed milk. The milk is subjected to heat at a low temperature (112° to 140° F.) and pressure until it has lost about three-fourths of its water, sugar of one-eighth to one-twelfth of the fresh milk being previously added. Condensed

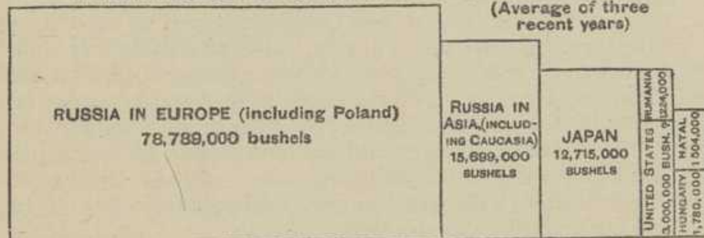


milk is prepared chiefly in Switzerland, Holstein, and Bremen, and in the United States (especially New York and Illinois). Asses' and mares' milk is preserved, as well as cows'. Powdered milk is subjected to evaporation until it is of the consistency of paste, and is then passed between granite rollers and exposed to a current of dry air. Milk sugar is made in Switzerland and the Bavarian highlands from whey by crystallisation. It is used in silvering mirrors and as a vehicle for medicines.

**Millboard,** a board made of waste material, such as old ropes and sacking, paper scraps, flax and jute refuse, wood, &c., reduced to a pulp. Some is made in moulds by hand, but the bulk now sent to market is made by machinery. Millboard is made into covers for books and boxes. The latter, however, are more frequently made with straw-board, that is, pulp of straw boiled in soda or lime.

**Millet.** Various plants of the Panicum, Setaria, and other genera of grasses, which are grown as cereals. Common millet (*P. miliaceum*), *P. miliare*, *P. frumentaceum*, and *P. pilosum*, are grown in India; German millet (*S. Germanica*) and *S. Italica* are cultivated in Germany and the south of Europe. *Penicillaria spiccata* or *Pennisetum typhoideum* (*Bajra* or *Cumbu*) is common in India, Africa, and the south of Europe, and is known as Egyptian millet and Guinea corn. Sorghum is known in India as great millet and *Eleusine corocana* as *ragi* or *marua*. *Digitaria sanguinalis*, or Polish millet, is cultivated in Poland and eaten as rice. The seeds of a species of millet grass (*Milium nigricans*), which are smaller than those of millet proper, are ground in Peru into a very white flour. The world's crop is about 114½ million bushels in countries where returns are compiled. There are also large areas under millet in India, and this cereal is grown extensively by the natives of Africa.

ANNUAL PRODUCTION OF MILLET IN PRINCIPAL COUNTRIES
(Average of three recent years)



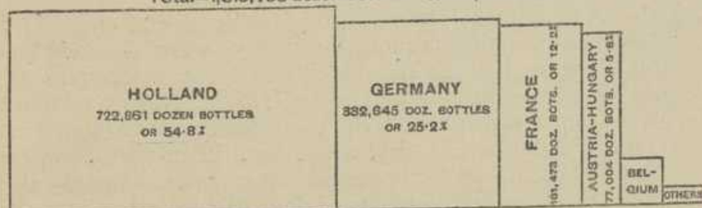

**Millstones.** *See* **Burr-Stones.**

**Mimosa Bark.** The bark of several species of acacia is exported for tanning from India (Babul bark), the Cape and Senegal, Réunion, and South America, and especially from Australia, where it is known as wattle bark. The *A. decurrens* of New South Wales yields the best bark, containing more than 30 per cent. of tannin.

**Mineral Oils.** *See* **Paraffin** and **Petroleum.**

**Mineral Waters.** At a large number of springs the water is bottled and exported into other countries. The most commonly sold waters are the alkaline acidulous waters of Apollinaris, Bilin, Vichy, and Vals; the muriated alkaline waters of Selters and Ems; the bitter waters of Budapest (Apenta, Æsculap, Hunyadi Janos, and Franz Josef springs), Kissingen, Friedrichshall, and Rubinat; the chalybeate waters of Spa, Kronthal, and Contrexéville; the muriated arsenical water of La Bourboule; and the exceedingly strong water of Levico, containing iron and a little copper, as well as arsenic. In the United States there are many mineral springs containing various ingredients, some of them closely resembling in their mineral contents the springs of Europe. Large quantities are bottled at the Saratoga springs, where there are alkaline, ferruginous, and other waters. The Virginian and Californian springs are also noted. Medicinal waters are also manufactured by mixing in chemicals, such as soda-water, Apollinaris, and Seltzer. What is generally sold, however, as Seltzer water is simply water aerated with carbonic acid gas.

IMPORTS OF MINERAL WATER INTO UNITED KINGDOM (Average 1902-4)
Total—1,319,753 dozen bottles. £279,540 value




**Minium.** Red oxide of lead. *See* **Lead.**

**Mink.** A small carnivorous animal of the genus Putorius, to which the ermine and ferret belong. The European vison (*P. lutreola*), the Siberian vison (*P. sibericus*), and the American mink are nearly related, if not merely varieties of the same species. They frequent water and swim excellently. The fur is valuable, and the vison is hunted in Northern Europe, especially in Russia, but the American mink skins, obtained in New England, are much superior.

**Mint.** All the species of mint yield an essential oil more or less medicinal, but the most valuable plant is peppermint (*Mentha piperita*), which is cultivated at Mitcham in Surrey, in Provence, and in Michigan and New York States, and yields the well-known sweetmeat and drug. Menthol is a kind of camphor left behind after the distillation of peppermint oil, and is especially abundant in Japanese mint.

**Mirabelles.** *See* **Plums.**

**Mirbane.** Nitrobenzol, which has an odour of bitter almonds, and is used to perfume soap.

**Mishmi.** The bitter rhizomes of *Coptis tecta*, of the order Ranunculaceæ, are gathered in Assam and used in India as a bitter tonic. In America the roots of *C. trifoliata* are similarly employed, and also yield a yellow dye.

**Mispickel.** Bisulphide of iron and arsenic, the commonest ore of arsenic.

**Mohair.** The silky white hair of the Angora goat (*Capra hircus*, var. *Angorensis*), a native of Asia Minor, whence it has been introduced into the United States, France, Cape Colony, and Victoria. Asia Minor and the Cape are the chief exporting countries. The average imports, 1902–4, mostly from Turkey, the Cape, and Natal, were 27,884,640 lbs. (£1,749,890). *See* **Camlet.**

**Molasses.** The syrup left after cane juice has been boiled and the sugar taken out. Rum is made from it, and a small quantity of sugar is sometimes extracted from it.

**Molybdenum.** This mineral occurs in Europe, Siberia, and North America, chiefly in the form of the bisulphide, called Molybdenite, and resembling graphite in appearance, and less frequently as wulfenite, or molybdate of lead. Till recently molybdic acid and molybdate of lead, used as chemical reagents, and the latter also in the colouring of china, were the only forms in which this metal was employed, but now it has been found that molybdenum imparts peculiar properties to hard steel. The quantity required is small, and the output being a few thousand tons of ore.

**Monazite,** a phosphate of the rare metals cerium, lanthanum, and didymium, with a varying percentage of thoria. The last is the valuable ingredient, being used in the manufacture of incandescent gas mantles. More than 860,000 lbs. of monazite were obtained in 1903 in North and South Carolina. It is also mined in Brazil. *See* also **Thorianite.**

**Monkey Skins.** Thousands of skins of black and grey monkeys are shipped from Senegal and Guinea, and are made into muffs and rugs.

**Mora.** The wood of the *Mora excelsa*, a tree of Guiana, which is much used for shipbuilding. The bark is a tanning material. *See* also **Fustic.**

**Morel,** a kind of fungus (*Morchella esculenta*, *patula*, &c.) eaten fresh in Southern and Central Europe, and dried and preserved for culinary purposes. It contains a poisonous ingredient which disappears in the process of drying, or may to a great extent be removed by soaking in water.

**Morocco Leather.** *See* **Leather.**

**Morphia.** *See* **Opium.**

**Mortadella.** Bologna sausage.

**Mosaic.** Designs formed by various coloured pieces of glass, marble, or terra-cotta, laid down as pavements or wall decorations, and made into smaller ornaments. The country where mosaics are chiefly made is Italy, where two kinds are produced—Florentine mosaic, in which various coloured stones of the required size and shape are inlaid in slabs of marble; and the Roman mosaic, consisting of small rectangular pieces of opaque glass (*smalt*) attached to a foundation with cement, or a vitreous composition. National mosaic factories have been established at St. Petersburg and Paris, but their work is not sold publicly.

**Mosaic Gold.** Stannic sulphide. *See* **Tin.**

**Moselle.** The wines of the Moselle are noted for their aromatic flavour. Some of the best known are Berncastel, Brauneberger, Pisporter, and Zeltinger.

**Moss.** *See* **Icelandic Moss, Carrageen Moss,** and **Spanish Moss.**

**Mother-of-Pearl.** *See* **Pearls.**

**Mudar Bark,** the root bark of *Calotropis gigantea*, used in India as a remedy for leprosy, &c., and also imported into Europe for medicinal purposes. The fibre is also used, that from the seeds being mixed with silk. The juice is mixed with caoutchouc, which it somewhat resembles.

**Mulberry.** The species most generally cultivated for its fruit is the black mulberry (*Morus nigra*). The *M. Indica* and *M. dulcis* of India, and the *M. rubra* of North America, also bear agreeable fruits. The white mulberry of China is the species best adapted for feeding silkworms, and is cultivated for that purpose in the south of Europe. Its root is famed as a vermifuge. Some species, especially the red mulberry of America, yield a fine-grained and strong wood. The paper mulberry (*Broussonetia papifera*) belongs to a different genus, of the order Urticaceæ. It is extensively cultivated in Japan for the manufacture of paper, and in the South Sea Islands cloth is made of the bast.

**Mum.** *See* **Beer** (Plate 93).

**Mundic,** a name given in Cornwall to iron pyrites.

**Mungo.** Shreds of old woollen cloth used for the manufacture of shoddy cloth.

**Munjeet.** *See* **Madder.**

**Muntz's Metal.** *See* **Brass.**

**Muscatel.** Several strong and sweet white and red wines are made in France, Italy, and other countries from Muscatel grapes. In France the most noted are those of Lunel in the Pyrenees, the white Rivesaltes, and the red Bagnol of Roussillon and Frontignac. The muscatels of Syracuse and Cagliari have also a good reputation, and the Lacryma Christi of Naples. *See* also **Raisins.**

**Muscovado.** Ordinary unrefined moist cane sugar.

**Mushrooms.** Several kinds are edible, the best flavoured being the common mushroom (*Agaricus campestris*), the fairy-ring mushroom (*A. oreades*), and the orange-milk mushroom (*A. delicissus*). Of the coarser kinds catsup is made. Mushrooms are cultivated, especially in France, in the catacombs of Paris and in caves. Besides Paris, Rheims and Amiens are the chief seats of the industry.

**Musk.** The musk of commerce is a secretion in a special gland of the male musk-deer (*Moschus moschiferus*), and is exported from China, Tonkin, and other countries. The musks of Tonkin and Nankin are the finest; that of India has an odour like civet, and is less esteemed, and the musk of Russia, called Cabardine, is the least valuable. Artificial musk is made from toluol and, like the natural, enters into the composition of a variety of perfumes. Other animals, as the beaver and civet, secrete a somewhat similar substance. *See* **Castoreum** and **Civet.**

**Musk Plants.** One of the most important that give out an odour of musk is *Hibiscus*, or *Abelmoschus moschatus*. The seeds, known also as ambrette or graines d'ambrette, are gathered in the East Indies, but the best come from Martinique. The root of *Ferula Sumbul*, an umbelliferous plant which grows in Turkestan and Persia, also supplies a substitute for musk.

**Musk Rat,** an amphibious animal of a genus of the shrew family, called also desman. The larger of the two species (*Myogale moschata*) is abundant from the Don to the Volga in Russia, and its skins, which exhale a musky odour, are an article of trade.

**Muslin,** a fine cotton fabric, differing from gauze in being woven without any looping of the warp threads on the weft. It was formerly made only in India, where Dacca was famous for the fineness and beauty of its muslin, but now it is largely manufactured in Great Britain, France, Switzerland, and Germany.

**Musquash,** sometimes called musk-rat and ondatra. A rodent of the mouse family (*Fiber zibethicus*), which lives in North America, between lat. 30° and 69°, especially in Canada. Large numbers of skins are exported for the manufacture of fur muffs, capes, &c.

**Mussels.** The common mussel (*Mytilus edulis*) is eaten, and is in great demand by fishermen as bait. In France, Germany, Italy, and other countries the cultivation of mussels is a not unimportant industry.

**Mustard.** White mustard (*Sinapis alba*) is cultivated in England, Germany, and Holland, and black mustard (*S. nigra*) grows in most countries of Europe, North Africa, the Far East, and America. Wild mustard (*S. arvensis*), or charlock, is seldom used except mixed with one of the other kinds. *S. juncea* is extensively cultivated in South Russia, more particularly near Sarepta near the Volga, and much of the mustard exported from India is of the same species. The condiment is made from the ground seeds, mixed with flour and various spices. The seeds of the black mustard yield an oil which is used in salads and for burning, and by distillation a pungent volatile oil, sometimes used in the preparation of mustard plasters. Ordinary mustard plasters are made of mustard flour from which the oil has been pressed out.

**Mutton.** *See* **Meat** (Plate 65).

**Myall Wood,** the hard violet-scented wood of *Acacia homalophylla* and other species growing in Australia, which is made into tobacco pipes and whip handles.

**Myrobalans,** the fruit of various species of *Terminalia*, about the size of a nutmeg. *T. belerica* furnishes the greater part of the fruit exported from India, but the myrobalans of *T. chebulica* and *T. citrina* are also used by tanners, dyers, and ink manufacturers, and those of *Emblica officinalis* of the order Euphorbiaceæ.

**Myrrh.** The gum resin which exudes from the bark of *Balsamodendron myrrha*, a tree of the order Amyridaceæ which grows in Arabia, Somaliland, and the East, and is sent to Europe chiefly from Bombay in the form of tears or grains. It is used medicinally as a tonic and stimulant, in dentrifices, and as incense, particularly in the Greek Church.

**Myrtle Wax.** Wax obtained by boiling the seeds of *Myrica cerifera* and other species. *See* **Candleberry.**

**Nails.** Nails are cut out of iron plate by hand, the head being formed in the cutting or afterwards finished with a hammer. These are being rapidly superseded by machine-made nails cut out of cold metal. Nails are also made of Bessemer and Siemens-Martin steel and combined iron and steel. Tin-plate scrap also is used in America. Wire nails, invented in France, are very tenacious. Cast-iron nails are used only in garden work and for nailing laths to hold plaster. Brass also is cast into nails. There is an enormous variety in the sorts and sizes of nails. The terms "fourpenny," "sixpenny" nails denote that four or six pounds is the weight of 1000. Brads are made so small that 1000 weigh only 1½ oz. Birmingham and Dudley are the great centres of the industry in England.

**Nankeen,** a durable kind of cotton cloth, originally made in China (Nankin), with the buff-coloured fibre of a variety of *Gossypium herbaceum*. It has been imitated in Europe by dyed cottons, but now the term, when used at all, is applied to cloths that have no resemblance to the original Chinese article.

**Naphtha,** a name used in a loose and general sense to denote oils of various kinds, but now usually confined to the lighter forms of hydrocarbon obtained by distillation from crude mineral oils, coal-tar, wood, &c. American petroleum yields 15 to 20 per cent. of naphtha, and Russia only 5 to 6 per cent. This naphtha is again separated into gasoline, benzine, and benzoline, which differ in their specific gravities, the last being the heaviest. The shale of Scotland yields only 4 to 5 per cent. of naphtha. From coal-tar 5 to 20 per cent. is obtained according to the kind of coal; this naphtha is much heavier than that distilled from oil. Caoutchine is a naphtha derived from india-rubber. Naphthas, formerly used sometimes as burning oils, are now chiefly employed as solvents, in extracting the perfumes of flowers, in the manufacture of india-rubber and gutta-percha goods, in the refining of paraffin wax, in mixing paints, &c. Out of doors these more dangerous oils are still used for illumination. Naphthaline, a solid hydrocarbon, obtained chiefly from coal-tar, is used in the albocarbon lamp to increase the illuminating power of gas. On the continent of Europe the term naphtha is commonly used to denote any burning oil. *See* also **Oils.**

**Neat's-foot Oil,** an oil obtained by boiling down the fat of cattle, exported chiefly from North and South America. It is used for softening leather and oiling clocks, when part of its stearine has been extracted.

**Needles.** These articles are manufactured chiefly in England (Redditch and neighbourhood), Aix-la-Chapelle and Burtscheid in Germany, and at Laigle (Orne), France. France, however, imports needles, and so do the United States of America, though needles are made in the north-eastern States. Besides sewing and darning needles, lace-working needles, knitting-needles, packing-needles, and upholstery needles are made. Needles for sewing-machines are of quite a different kind, having the eye near the point, and other peculiarities. They are manufactured to a large extent in England.

**Negrohead.** A kind of manufactured tobacco. *See* **Tobacco.**

**Neroli Oil.** *See* **Orange.**

**Nerprun.** A French name for Avignon berries (*q.v.*).

**Neufchâtel,** a cream cheese made at Neufchâtel-en-Bray, in Normandy.

**Neutral Oil,** or neutral lard. Lard separated from the animal fibre. It retains no animal taste or odour, and hence the name. It is an important ingredient of margarine.

**New Zealand Hemp,** or Flax. The fibre obtained from the long leaves of a liliaceous plant, *Phormium tenax*, which is twisted into ropes and twine, and is a rival of manila hemp. The prepared article is known as phormium.

**Nicaragua Wood.** *See* **Brazil Wood.**

**Nickel.** A white malleable metal contained in several ores. One of the most plentiful is nickel arsenide or niccolite. Genthite and garnierite, hydrous silicates of nickel and magnesium, are also valuable ores, and are worked in New Caledonia. Millerite, nickel sulphide, is not often found in large quantities. The largest deposits are in the Sudbury district, Canada, where the metal occurs as pyrrhotite or iron sulphide. Norway also produces a few thousand tons of ore. Nickel enters into the composition of German silver, and into the small coinage of some European States and of the United States of America.

PRODUCTION OF NICKEL IN PRINCIPAL COUNTRIES IN 1904

CANADA AND UNITED STATES 5,900 tons (£1,086,200)
ENGLAND 2,160 tons (£372,000)
GERMANY 1,970 tons (£290,500)
FRANCE 1,770 tons (£252,300)

Nickel steel is extensively used in the manufacture of armour plates, propeller and other shafts, and bicycles. Nickeloid is a nickel-plated sheet of zinc used in the manufacture of reflectors, refrigerator linings, &c., and an alloy of nickel, aluminium, and copper has been introduced. Goods plated with nickel do not tarnish so readily as silver. The monoxide is a green powder, and gives a brown soft colour to china. The sulphate is sometimes prescribed as a medicine. In 1905 the production of Canada was much larger than in any previous year, *viz.*, 84,271 tons, valued at £1,551,700.

**Niger Seed.** The small black seed of *Guizotia Abyssinica*, from which an oil used for culinary purposes is extracted and exported to Europe.

**Nigrine,** or Black Rutile, containing a large proportion of ilmenite (Ferrous titanate). It is used for polishing metals. *See* **Titanium.**

**Nigrite,** a composition of india-rubber and black wax distilled from ozokerite. Nigrite is used as an electrical insulator.

**Nitrate.** This name is generally understood to mean nitrate of soda, a mineral found in several countries, but nowhere so abundant as in the deposits of Peru and northern Chile, where the impure nitrate, or *caliche*, covers immense areas in the desert tracts. Hence this substance is often called Chile saltpetre. It is a valuable manure, and on account of its cheapness is employed in the manufacture of nitric acid and nitre, in metal works, curing meat, &c. The production of the Chilean Association in 1904–5 was 1,660,000 tons, of which 1,548,000 tons were exported. The quota fixed for 1905–6 was over 1,766,000 tons, and has been largely increased for 1906–7. The imports into the United Kingdom in 1902–4 averaged 117,398 tons (£1,107,920), 92 per cent. coming from Chile direct.

**Nitre.** *See* **Saltpetre.**

**Nitric Acid,** formerly called aqua fortis, is usually manufactured from nitrate of soda. It is one of the most important of acids, being used in the manufacture of several other acids, ammonia, picric acid, nitro-glycerine, and other explosives, in extracting metals from their ores, in the refining of gold and silver, and in the production of nitrates of silver, mercury, lead, and copper.

**Nitro-benzol.** *See* **Benzene.**

**Nitro-glycerine.** Glycerine is dissolved in equal parts of equal parts of strong nitric and sulphuric acids, and then poured into water when the nitro-glycerine is precipitated. It is an explosive of great strength, its force being equal to that of eight times the same weight of gunpowder. It is very easily exploded by concussion, and cannot be transported with safety. Therefore it is used only when compounded with porous substances, as in gelignite, dynamite (*q.v.*), &c.

**Noyau.** *See* **Liqueurs.**

**Nutmegs,** the kernel of certain species of *Myristica*. The true nutmegs are produced by *M. fragrans*, a species indigenous to the Moluccas, Banda Islands, and New Guinea. The tree has been introduced into British India, Java, and South America, and is cultivated successfully in Réunion. *M. fatua*, of the Banda Islands, yields a long nut of inferior quality, which, however, sometimes appears on the European market. Under pressure a fatty substance exudes from the nut, which by distillation yields an essential oil used in medicine. The pulp of the fruit is mace (*q.v.*).

**Nutria Skins.** The name *Nutria* (otter) is given in South America to the rodent *Myopotamus coypu*, which inhabits the temperate parts of South America, and is hunted for its fur.

**Nuts.** Common nuts are the fruit of *Corylus Avellana*, named after the town of Avellino in Lower Italy, whence they are still exported in large quantities. There are two varieties—the cob-nut and the longer filbert nut. Italy exports considerable quantities, Piedmont sending its produce chiefly to Paris, while Spain supplies Great Britain, where the nuts are generally known as Barcelona nuts. The nuts yield an oil which dries readily, and is therefore used by painters; perfumers mix it with expensive fragrant oils. Constantinople nuts (*C. colurna*) are frequently pressed for their oil, but have less flavour than the other kinds. *See* also **Walnut, Coco-nut, Brazil Nut, Candle Nut, Pecan Nuts,** &c.

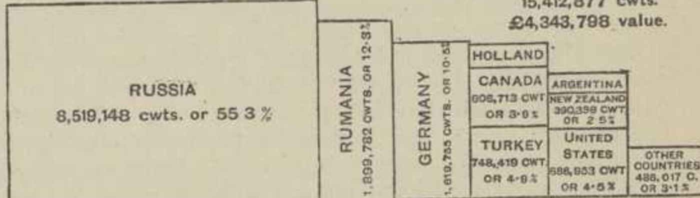
**Nux Vomica,** the large round seeds of *Strychnos nux vomica*, a native of the East Indies, whence they are exported. Strychnine, a tincture, and a tonic are prepared from them and prescribed as medicines. The bark used to be mixed with Angostura bark, and was therefore known as False Angostura bark.

**Oak.** The common oak (*Quercus robur*), the Turkey oak (*Q. cerris*), the white or Quebec oak (*Q. alba*), the live oak (*Q. virens*) of the southern United States, and the red oak (*Q. rubra*) of North America are the most esteemed for their timber. The barks of most species furnish tan, and a bitter extract, Quercine, is prepared from them; the Valonia (*q.v.*) oak (*Q. ægilops*) of the Levant is particularly rich in tannin. Of American species *Q. prinus* is most frequently used. *Q. suber* yields cork, *Q. infectoria* galls, *Q. tinctoria* quercitron dye, *Q. coccifera* kermes dye, and *Q. mannifera* manna.

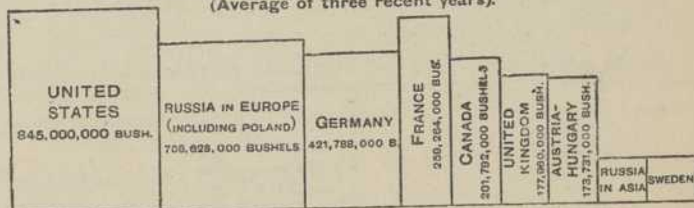
**Oakum,** the rough and tarry fibre obtained by unroving pieces of old rope. It is used in caulking the seams of ships.

**Oats.** Oats thrive best in a damp and comparatively cool climate, and therefore are most extensively cultivated in the middle and northern latitudes of Western Europe. As, however, they require about three weeks longer than barley to arrive at maturity, they are not much cultivated north of 65°. Oats are the most important cereal in Scandinavia, Scotland, Canada, and New Zealand. In the more southern States of Europe, the United States of America, and Australia they are grown chiefly as food for animals, while in South America they are grown sparingly in the Argentine Republic and at great elevations in the Andes. There are several kinds, which, however, are probably merely varieties of the common oat (*Avena sativa*). The chief are the Hungarian or Tatar oat (*A. orientalis*), the naked oat (*A. nuda*), the Chinese (*A. Chinensis*), and the short (*A. brevis*). *A. pubescens* and *A. flavescens* are grown for fodder. The world's crop is about 3137 million bushels, of which Europe produces 1996 and North America 1047.

ANNUAL IMPORTS OF OATS INTO UNITED KINGDOM (Average 1902-4)



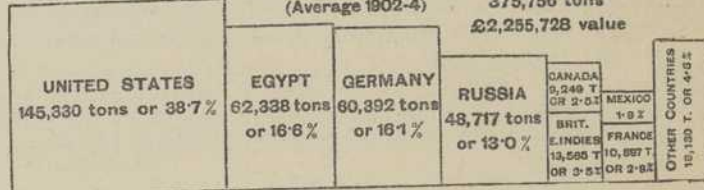

ANNUAL PRODUCTION OF OATS IN PRINCIPAL COUNTRIES (Average of three recent years).




**Ochre,** oxide of iron mixed with lime and clay in varying proportions, so that the colour is a lighter or darker yellowish brown. Burning makes the colour red, and the earth is then known, according to the tint, as light red, Indian red, &c. Sienna earth acquires by burning a rich chestnut colour. Umber is an ochre containing manganese, of which the finest quality is obtained from Cyprus. The earths are used in the preparation of paints, both oil and water colours, and are sometimes applied in the form of powder—to colour chamois leather, &c. The largest producers of ochre are, in order, France, Great Britain, and the United States. Many ochres are also produced artificially.

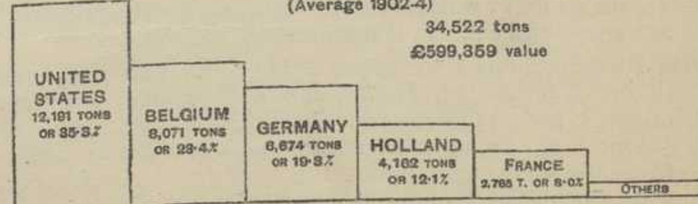
**Oilcake,** the refuse of oil seeds, such as linseed, rape-seed, cotton-seed, coco-nut seeds, sunflower seeds, &c., after the oil has been pressed out. It serves as fodder for cattle. The chief exporting country is the United States, which sends out fully 735,000 tons, considerably more than half being cotton-seed. Russia exports about 279,000 tons of linseed, hemp, sunflower, colza, and rape oilcake. Egypt exports about 41,000 tons of cotton-seed cake, and China 260,000 tons of bean-cake.

ANNUAL IMPORTS OF OIL-SEED CAKE INTO UNITED KINGDOM (Average 1902-4)




**Oils.** Oils are obtained from the animal, vegetable, and mineral kingdoms, and are divided into two groups—*fixed* oils, which at a high temperature undergo decomposition, and *essential* or *volatile* oils, on which the odoriferous properties of plants depend, and which are not changed by distillation. *Animal oils* include butter and lard, tallow, horse-grease, neat's-foot oil, neutral lard, and oleo oil; also the oils of whales, seals, and fish, such as cod, shark, porpoise, menhaden, pilchard, herring, sardine, and tunny. The oil of birds is used only to a small extent. Of vegetable oils, which are very numerous, the following are of most importance—Cotton-seed, linseed, palm, colza or rape, olive, poppy, ground-nut, sesamum, castor, soy, maize, walnut. Bassia, nutmeg, carapa, carnauba, and cocoa yield a thick oily substance approaching butter in consistency. All the

ANNUAL IMPORTS OF SEED OIL IN UNITED KINGDOM (Average 1902-4)



above oils are described under separate headings, as well as numerous essential oils used chiefly as perfumes. Mineral oils are treated of under **Petroleum, Paraffin, Naphtha,** &c. The diagram shows the imports of cotton-seed, linseed, rapeseed, and other oils.

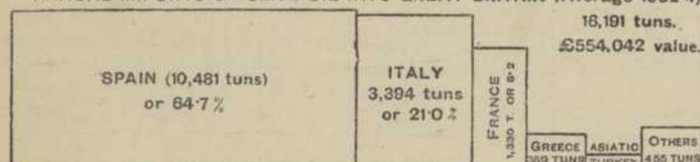
**Okra,** the seeds of *Hibiscus* or *Abelmoschus esculentus*, used to thicken soup. The plant grows in the East and West Indies, Africa, and the south of France. The stems yield a fibre.

**Oleo oil,** an oil obtained by melting and pressing the fat of cattle so as to separate it from the fibre and stearin. It is one of the chief ingredients of margarine. Oil made from sheep fat cannot be neutralised, that is, entirely freed from the odour and flavour of the animal, and therefore makes an inferior margarine.

**Olibanum.** *See* **Frankincense.**

**Olive,** a small tree which is cultivated in Mediterranean countries and the East, and has been introduced into America and Australia. The European olive is *Olea Europea*, and is found in two chief varieties, that grown in Spain having larger fruits. *O. Americana* also bears edible fruits. This and other olives seem to be only varieties, which easily revert to the original type. The fruits are eaten fresh, dried, or, more commonly, preserved in brine, and the latter kind are exported. But the most important product is the oil which is expressed from the fruit, of which large quantities are exported from Spain, Italy, Greece, the Levant, and Algeria. The wood is beautiful in colour and grain, and takes a high polish. Some varieties of *Olea* have a very hard wood, and are called ironwood (*q.v.*) in the countries where they grow. Italy produces about 68 million gallons of olive oil, and Spain 46 millions; Greece exports nearly 1½ millions on an average.

ANNUAL IMPORTS OF OLIVE OIL INTO GREAT BRITAIN (Average 1902-4)




**Onions.** This vegetable gives rise to a considerable trade between European countries, North Africa, the Canaries, &c. In the warmer countries the quantity of acrid volatile oil the root contains decreases, and the milder kinds are produced, known as Spanish onions.

**Opal,** a form of silica, which, when translucent and displaying a variety of colours, is sold as a precious stone. The best stones are obtained at Czervenitsa in Northern Hungary, and they are also found at Esperanza in Mexico, Colorado, New South Wales, and Queensland.

**Opium,** the inspissated juice of a poppy (*Papaver somniferum*). The plant is largely grown in India, Persia, Asia Minor, and, for local consumption, in China. Indian opium for export is grown round Patna and Benares and on the fertile tableland of Central India, the old kingdom of Malwa. Chinese opium is very poor in morphine, the most important alkaloid. Morphine is more rapid in its effect, and is used for hypodermic injection.

**Opoponax,** a gum resin, occasionally exported from Persia. It is supposed to be obtained from the plant *Opoponax chironium*. The perfume, called Opoponax, is derived from a *Balsamodendron*.

**Opossum.** Large quantities of the skins of *Phalanga vulpina* are exported from Australia, and a smaller number of the more valuable skins of the American opossum, *Didelphys Virginiana*, are sold annually.

**Oranges.** *See* **Fruit** (Plate 97).

**Orchella,** the lichens used by dyers, chiefly *Roccella tinctoria* and *R. Luciformis*. They are exported in the form of paste (*see* **Archil**) from the Canaries, Cape Verd Islands, Angola, Madagascar, Mozambique, California, and South America. Indian orchella is *R. montagni*, which grows on the trunks of mangroves. Other kinds of lichen are collected for dyeing in the inland parts of France, Norway, and Sweden; they are not so rich in colouring matter as the sea lichens.

**Organzine.** *See* **Silk** (Plate 121).

**Origanum Oil.** The name strictly denotes oil of marjoram, but under this name thyme oil is exported from Turkey. A cheap origanum oil is composed of turpentine, lavender, rosemary, and thyme oil.

**Orpiment,** a trisulphide of arsenic (*q.v.*), of a golden yellow colour, whence its name, which signifies "gold pigment." It is used as a cheap pigment, and is often called King's Yellow.

**Orris Root,** probably a corruption of Iris root. The root stock of *Iris Florentina, I. Pallida*, and *I. Germanica*, which are exported from Florence and Mogador, and also from the Levant. On drying it acquires an odour of violets, and is frequently sold as violet root. It is chiefly used in perfumery, and a tincture made from it is sold as essence of violets.

**Orsidew,** a name for Dutch metal (*q.v.*).

**Ortolan,** a kind of bunting (*Emberiza hortulana*) very common in Central and Southern Europe, and much prized for its delicate flavour. Large numbers are netted and fattened for the table.

**Osier,** the popular name for those kinds of willow which are used in basket-work. The common osier (*Salix viminalis*) is used for rough work, but the finer kinds of basket are made from varieties produced by cultivation, such as the fine basket osier (*S. forbyana*), the green-leaved osier (*S. rubra*), Spanish Rod (*S. triandra*), and the golden osier (*S. vitellina*). Osiers are cultivated in Great Britain, Holland, Belgium, and France.

**Osmium,** a rare metal occurring in the mineral osmiridium in platinum ores. It is now used in the manufacture of the Auer and Nernst incandescent electric lights. *See* also **Iridium.**

**Osnaburg,** a coarse linen fabric named after the town of Osnabrück in the Prussian province of Hanover.

**Ostrich Feathers.** The ostrich is confined to Africa, Arabia, and Syria. Quantities of feathers are brought from the Western Sudan, and feathers of wild birds are the best. About three-quarters of the feathers brought to market are, however, obtained from domesticated birds. In this industry Cape Colony still retains the first place, though ostrich-farming has been introduced into Algiers, Australia, Uruguay, and California. In 1904 Cape Colony exported feathers to the value of £1,058,988 (470,381 lbs.), and Natal to the value of £1615. Tripoli exports from the Sudan were worth over £20,000 in 1903-4. Feathers of the American rhea or nandu are also brought to market and commonly sold as "vulture" feathers.

**Otter.** The land otter (*Lutra vulgaris*) is widely distributed, and is hunted for its fur. Large numbers of skins are exported from North America of the species *L. Canadensis*. The sea-otter, *Enhydra lutris*, is a large animal, sometimes weighing 90 lbs. It frequents the North Pacific, but, possessing a very valuable fur, has been killed in large numbers and is becoming very scarce.

**Otto.** *See* **Attar of Roses.**

**Ounce.** The jaguar (*Felis onca*) is found all over South America except in the extreme south, and in Texas and California. Its skin, covered with dark rings and much resembling that of the leopard, is used for hearthrugs, &c.

**Oxalic Acid,** an organic acid ($H_2C_2O_4$) which is widely distributed in the vegetable kingdom, usually as a salt of lime, and is most commonly obtained by the oxidation of starch or sugar by nitric acid. It occurs in colourless transparent crystals, and is employed in cotton-printing, bleaching straw, and in testing certain chemicals. Oxalate of ammonia is a recognised test for lime, and the binoxalate of potash is the so-called salt of lemons used for removing ink-stains.

**Oysters.** The common oyster (*Ostræa edulis*) is found in Europe as far north as 65° N. latitude, and is taken off the shores of England and Norway, Schleswig, Brittany, and the Bay of Biscay. In many countries the spat is transferred to specially prepared beds. Of these cultivated oysters the most prized are the Whitstable "natives," and the oysters of Marennes at the mouth of the Seudre in France. The oysters of Cancale, in Brittany, also fetch a high price, and large quantities are cultivated at Arcachon and Ostend. The American oyster (*O. Virginica*) is extensively cultivated in Long Island Sound and Chesapeake Bay. In Australia there are two chief kinds, a variety of *O. edulis*, and the Rock oyster, *O. glomarata*. They are cultivated especially in Tasmania and Queensland. The cultivated oyster or native is distinguished by its thin shell and large proportion of meat, Whitstables often yielding one-fourth of their weight, whereas the meat of deep-sea oysters is only one-tenth of the total weight.

**Ozokerite,** a hydrocarbon of an elastic texture, and generally brownish, yellowish, or greenish in colour. It is found in Lower Austria and Galicia, near Newcastle in England, in Transcaucasia, Persia, Egypt, Algeria, Canada, and Mexico, but in paying quantities only at Boryslaw and Dzwiniacz in Galicia. When washed and melted into cakes it is known as ceresine, and is used for making candles, paraffin, and for all purposes to which beeswax can be applied. The output is small, about 2700 tons.

**Packfong.** A Chinese alloy containing copper, nickel, zinc, and 2 per cent. by weight of silver.

**Paddy.** *See* **Rice.**

**Paku Kidang,** the hairs of south Asiatic tree-ferns, sold for stuffing pillows, &c.

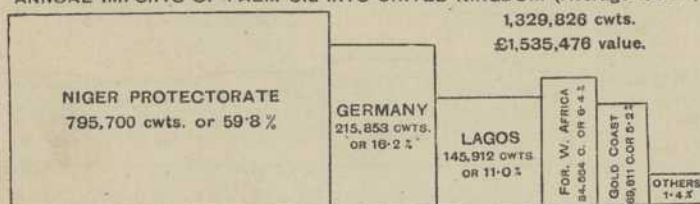
**Palisander Wood,** a dark brown wood with a violet tinge, much esteemed for cabinet work. There are several kinds, one of which is the product of *Jacaranda Brasiliana*, and another of a species of *Dalbergia*. The best quality comes from Brazil, especially Rio de Janeiro. Less valuable palisander is supplied by India and Madagascar.

**Palladium,** a metal closely resembling platinum in colour and ductility. It is found associated with platinum and gold in the Ural mountains and Brazil, the auriferous sands of the latter

country being the chief sources of supply. Being white and hard, and resisting the oxidising action of air, it is well suited for the scales of scientific instruments and for dentistry, but its scarcity limits its use.

**Palma Christi.** *See* **Castor Oil.**

**Palm Oil.** The palm oil of Africa is obtained from the fruit pulp of *Elaïs Guineensis*, and the kernels of the fruit are also exported for the extraction of oil. The tree has been introduced into the West Indies and South America. In temperate climates the oil assumes the consistency of butter. It is used in the manufacture of soap and stearine, and as a lubricant. For other oils derived from palms, *see* **Coco-nut Oil** and **Cohune Oil.**




**Palmyra Wood.** Properly the wood of the Palmyra palm (*Borassus flabelliformis*), but the wood of several other palms is sold under this name. It is made into sticks, buttons, &c.

**Panama Bark.** A name for the saponaceous bark of the *Quillaja* (*q.v.*).

**Panama Hats.** Hats woven in one piece from the leaves of *Carludovica palmata*, a kind of screw pine which grows in the Andes. They may be rolled up without injury. The finer kinds are sold for £20 and more apiece. *See* **Hats.**

**Paper.** Paper is made of vegetable fibres reduced to a pulp, which is run on to a gauze apron, pressed, sized, and dried. Formerly rags were the chief material used, especially linen, but the supply has long ceased to satisfy the needs of the mills, and many other materials, such as bamboo, straw, jute, New Zealand flax, and maize leaves have been resorted to. Only esparto and wood-pulp have acquired importance. The former can be manufactured into the finest quality of writing-paper, but the latter, owing to the shortness and hardness of its fibre, can only be used in conjunction with other material. It is, however, utilised in increasing quantities, and is largely manufactured in Sweden and Norway and in North America. Conifers yield the best pulp. Straw is also used somewhat extensively for coarser kinds of paper, and waste paper can now be re-made. Paper is made in large rolls by automatic machines, but hand-made is more durable, and is still occasionally employed for printing *éditions de luxe*, &c. There are many varieties of paper—paper for printing newspapers and books, for writing, for cigarettes, blotting and filtering papers, papers of various strengths and coarseness for packing goods, &c., fine thin paper for covering engravings, copying, &c., as well as wall-papers. Pulp is also used now for a variety of articles, such as wheels and casks. The chief paper-exporting countries are Great Britain and the United States. *See* also **Cardboard, Millboard,** and **Papier-mâché.**

**Papier-mâché.** The best papier-mâché is made by Clay's method of pasting together specially prepared sheets of paper on a mould, but it is often made of pulp, to which glue has been added, pressed between dies. Carton-pierre, used for house decoration, consists of paper pulp mixed with whiting and glue; and Martin's Ceramic papier-mâché is composed of pulp, resin, glue, and sugar of lead. When ready the surface is decorated with paintings, gold-leaf, and thin scales of mother-of-pearl. The introduction of cheap Japanese lacquer ware has forced manufacturers to adopt a cheap method of decoration by transfer printing, and the material used now is generally wood-pulp.

**Paraffin,** a burning oil obtained from petroleum, shale, bituminous coal, &c. Paraffin-wax is a solid, white, tasteless substance with a melting point varying from 80° to 130° F. The softer wax is used in the preparation of matches, and the harder is the substance most commonly used in the manufacture of candles.

**Paraguay Tea.** *See* **Maté.**

**Parchment.** Skins of animals carefully prepared for writing on, and other purposes. Common parchment is generally made from sheep-skins, fine parchment or vellum from the skins of kids, lambs, and young calves, and the parchment used by bookbinders from pig-skin. When intended for writing on the parchment is worked over with sifted chalk and pumice-stone.

**Pareira Brava,** a climbing plant, indigenous in the forests of Peru and Brazil. Its botanical name is *Chondodendron tomentosum*. The root contains a bitter principle which is prescribed in urinary diseases.

**Paris Green,** a pigment—aceto-arsenite of copper; called also Schweinfurt green.

**Parmesan,** a cheese made in the neighbourhood of Bergamo, Pavia, and Cremona, Italy, and exported in considerable quantity. It is used in cooking.

**Partridge Wood,** a cabinet wood of unknown origin, often identified with the Bois perdrix (*Heisteria coccinea*) of Martinique and Guiana, but probably the product of a leguminous tree, *Andira inermis*, which grows in the West Indies and Brazil.

**Patchouli,** a scent derived from the leaves of *Pogostemon patchouli*, a plant which grows in the East Indies, particularly in Sylhet, Ceylon, Java, and the Malay Peninsula. It is used in perfumery, and an essential oil of great potency is extracted from it. It drives away moths, and is held by the Arabs to possess curative properties.

**Patent Fuel.** *See* **Briquettes.**

**Peach,** the fruit of *Persica vulgaris*, which is grown in all the milder countries of Europe, and will ripen out of doors even in the southern parts of England. As an article of international commerce, however, the fruit is of importance chiefly in California, where peaches are tinned to the value of about £63,000 annually. Some are also exported from the Cape of Good Hope and Argentina. The nectarine is merely a variety of the peach.

**Peach Wood.** *See* **Brazil Wood.**

**Peacock.** There are two kinds of peacock, *P. cristatus* of India and Ceylon, which is domesticated in Europe, and *P. muticus* of Java, Borneo, &c. The feathers are exported.

**Pea-Nuts.** *See* **Ground-Nuts.**

**Pear.** The pear (*Pyrus communis*) is grown in numerous varieties in all temperate countries. In the United States they are extensively cultivated in New Jersey, Delaware, Colorado, and California, the Bartlett pear being the favourite kind, and large quantities are canned. Pears are also sent to Europe from the Argentine Republic and the Cape of Good Hope, and these have the advantage of ripening in the winter of the northern hemisphere, when fresh fruit is not to be had here. *See* also **Prickly Pear.**

**Pearl-Ash.** *See* **Potash.**

**Pearl Barley.** *See* **Barley** (Plate 76).

**Pearl Powder.** *See* **Bismuth.**

**Pearls.** *See* Plate 149.

**Peas.** There are two distinct species of pea—the garden pea, *Pisum sativum*, and the field pea, *P. arvense;* but there are innumerable varieties. There is a considerable trade in dried peas and pea-flour, which are exported especially from Denmark and North America, and also from Germany, Holland, and Morocco. The Chick pea (*q.v.*) is a vetch and not a pea.

**Pecan Nuts,** the fruit of *Carya olivæformis*, a species of hickory which grows chiefly in the States of Texas, Louisiana, and Mississippi, North America. The nuts are exported to Europe, and yield an oil which is used in the United States for the same purposes as walnut oil in Europe. The white hickory, *C. alba*, and the true hickory, *C. ovata*, also yield nuts, and the wood is used to make cart-hoops, handspikes, carriage shafts, &c.

**Pekan.** *See* **Marten.**

**Pellitory.** The pellitory of chemists is the root of the Spanish pellitory, *Anacyclus pyrethrum*, which also grows in Algeria and Arabia. Another species, *A. officinarum*, is cultivated in Bohemia and near Magdeburg, and its root is also used in medicine, and in the composition of some kinds of snuff.

**Peltry,** a general name for undressed skins of fur-bearing animals.

**Penang Lawyers,** stems of a palm, *Licuala acutifolia*, exported from the Malay Peninsula, and dressed and polished for walking-sticks.

**Pencils.** Ordinary pencils are made of graphite, or graphite mixed with clay (*see* **Black-Lead**). The wood used is that of the Virginian or Florida cedar (*Juniperus Virginiana*), which is straight grained and easily cut. The pencils are stamped with the letters H for hard, B for black or soft, and F for firm, a repetition of the letters indicating a higher degree of the quality. In the United States S is used for soft, V for very, and M for medium. Formerly when the graphite mines of Borrowdale were productive pencils were made in England, and some are still manufactured at Keswick, but the great seat of pencil-manufacture at the present time is Nuremberg. They are also made in the United States and Canada. Coloured pencils are made of pigments mixed with wax or gum and tallow, and clay is sometimes added. In copying and indelible pencils a concentrated solution of aniline violet is used.

**Penguin Oil.** *See* **Oils.**

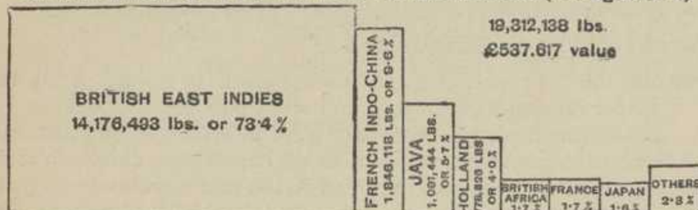
**Pennyroyal,** *Mentha pulegium*, a species of mint which grows in Europe and Western Asia. It is popular as a domestic medicine. A small plant of North America, *Hedeoma pulegoides*, is also known as pennyroyal, and possesses similar properties. Essential oils are extracted from both plants.

**Pens.** *See* **Steel Pens** and **Quills.**

**Pepper,** the berry of *Piper nigrum*, a native of the East Indies, and now cultivated in other tropical countries. White pepper is the seed from which the skin and pulp has been removed,

and is less pungent. *Piper troicum*, closely allied to common pepper, but more pungent, is also grown in some parts of India, and also *Chavica Roxburghii*, which yields Long Pepper (*q.v.*). The black pepper of Malabar is considered the best, and those of Tellicherry and Penang the best white peppers. The name pepper is also given to the products of several other plants, as Cayenne pepper, Jamaica pepper, or Pimento, and Guinea or Malaguetta pepper.

ANNUAL IMPORTS OF PEPPER INTO UNITED KINGDOM (Average 1902-4)




**Peppermint.** *See* **Mint.**

**Pepsine,** one of the chief constituents of gastric juice. It is prepared from the stomachs of calves, sheep, and pigs, and is sold in powder or in solution. It is prescribed medicinally in wine and other preparations.

**Perch,** a genus of fishes represented in Europe and Northern Asia by the freshwater perch (*Perca fluviatilis*), and the Basse (*Labrax lupus*). Of the American species the Yellow Pike (*Stizostedion vitreum*) is the most important, and in Australia the Murray Cod (*Oligorus Macquariensis*) is much esteemed as a food-fish. The basse is of the same family. The common basse (*Labrax lupus*) is found in Northern Europe, and the striped basse, or rock-fish, in North America.

**Percussion Caps.** Gun caps are small copper cylinders filled with fulminating mercury mixed with nitre, sulphur, &c.

**Perfumery.** There are at least sixty different substances used in perfumery. Firstly, there are the gum-resins, such as benzoin, opoponax, tolu, Peru, and storax, which are the chief ingredients of incense and pastilles. Then, essential oils are extracted from lemon and orange peel, orris-root, sage, mint, and thyme, rosewood, and sandalwood, cassia and cinnamon bark, caraway seed, &c. Some flowers do not yield an essential oil, or only in very small quantities. Their odours are extracted by *enfleurage*—that is, by laying the flowers on thin layers of grease, or by maceration; that is, by infusion in melted fat. Oil of jasmin, for instance, is thus prepared. The oil or fat is afterwards infused in strong alcohol to form the scents sold by the perfumer. The perfumes of animal origin—musk, ambergris, civet, and castor—are very strong and lasting, and are often mixed with other odorous substances to render them less evanescent. Several artificial scents are now made by chemical mixtures. France and England are the chief countries for the manufacture of perfumery, and Bulgaria exports large quantities of rose essence.

**Pernambuco Wood.** *See* **Brazil Wood.**

**Persian Berries.** *See* **Yellow Berries.**

**Persimmon.** *See* **Date-Plum.**

**Peru Balsam.** *See* **Balsams.**

**Peruvian Bark.** *See* **Cinchona.**

**Petrol.** Gasolene manufactured for use in motor carriages. *See* **Petroleum.** Petrol has a specific gravity varying from 0.680 to 0.730.

**Petroleum.** *See* Plate 152.

**Pewter.** *See* **Alloys.**

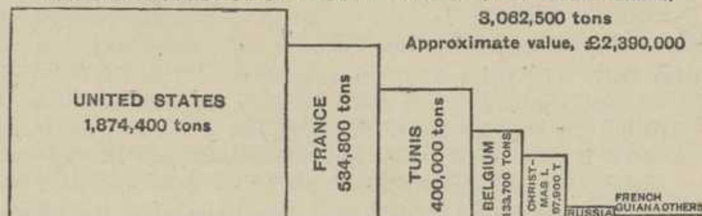
**Pheasant.** The pheasant is sold for food, and the feathers of many species are used as ornaments, especially those of the Argus pheasant (*Argus gigantea*), a native of the Malay Peninsula and Siam.

**Phenol Dyes.** Compounds of phenol or carbolic acid, derived from benzine and naphthaline, are much used in dyeing. Among the most important are picric acid (yellow), napthol or Martin's yellow, phthaleins, cerulein (green), and eosine (red).

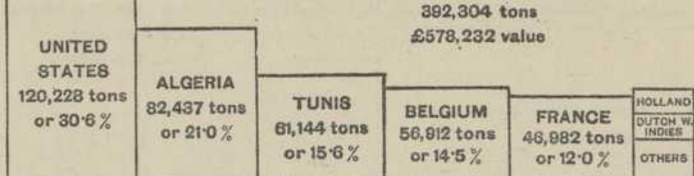
**Phormium.** *See* **New Zealand Hemp.**

**Phosphates.** Phosphorus is one of the metalloid elements, and occurs in two important allotropic forms—ordinary phosphorus and red phosphorus—the latter being produced by heating ordinary phosphorus to a temperature of 464° F. in a closed vessel. Red phosphorus is not so easily set on fire, and is not poisonous. When red phosphorus is used in the manufacture of matches, there is no danger to the health of the operatives. Bones used to be the chief source of phosphorus, but now it is made chiefly from apatite, a phosphate of lime, and especially the particular form known as sombrerite, because found on Sombrero, an island to the east of the Virgin Islands in the West Indies. Guano is largely phosphatic, and phosphate of lime occurs in coprolites and other substances which are used as manure. The chief sources of phosphatic rock are the United States, particularly Florida, Tennessee, and South Carolina, and France (including Algeria).

ANNUAL PRODUCTION OF PHOSPHATE ROCK (from recent returns)




ANNUAL IMPORTS OF PHOSPHATE OF LIME AND PHOSPHATE ROCK INTO UNITED KINGDOM (Average 1902-4)




**Physic Nuts,** the seeds of *Curcas purgans*, a bush indigenous in Cuba, the tropical parts of South America, and the Cape Verde Islands. The seeds are a powerful purgative, and their oil, commonly known as Jatropha oil, is used for burning, and as an irritant, like croton oil. The seeds are exported from the Cape de Verde Islands to Europe.

**Pianofortes.** The manufacture of pianos is chiefly carried on in London, Germany, France, and New York.

**Piassava.** The palm *Attalea funifera* is common in the Amazons basin, and yields a fibre from which ropes and mats are made. Piassava fibre is shipped also to Europe, where it is made into brushes and brooms. A fibre from another Brazilian palm, *Leopoldina piassava*, is known by the same name. Brazil exported about 1440 tons in 1904, which was less than in 1902 and 1903.

**Pichurim Beans.** *See* **Sassafras.**

**Picric Acid,** or Trinitrophenol, is used in dyeing (*see* **Phenol Dyes**). Its ammonia salt is an ingredient in explosives.

**Pigeons.** Pigeons are bred in many countries, as fancy birds, for pigeon racing and shooting, and also as food. In France the pigeons of La Bresse, the Mâconnais, and Picardy are sent to market, and birds are also exported from Italy.

**Pigs.** *See* **Swine.**

**Pilchard,** a fish of the herring tribe, *Clupea pilchardus*, or *Alosa sardina*, the sardine of the French. It is caught in the British Channel, in the Bay of Biscay, off the coasts of Spain and Portugal, and in some parts of the Mediterranean. The English pilchard is much larger than the French sardine, but is of the same species. Pilchards are now prepared in oil at Mevagissey in Cornwall, but a much larger quantity of sardines is imported from France. Many are simply salted for export. Italy draws its supplies from Tunis and Algeria.

**Pilots,** heavy blue cloths made of wool and mixed materials.

**Pimento,** the dried fruit of *Eugenia pimenta*, a small tree chiefly confined to Jamaica. The berries, about as large as pepper corns, are dried and ground to powder, in which form the condiment is known as allspice or Jamaica pepper. Oil of pimento is sometimes used as a remedy for toothache. In 1905 Jamaica exported 154,335 cwts. (£136,969), but less than half that quantity in 1904.

**Pina Muslin,** a fabric made in the Philippines from the fibre of certain small-fruited pine-apples and allied plants.

**Pinang,** Malay name for betel-nut.

**Pine Oil and Wool.** From the needles of the Scotch fir (*Pinus sylvestris*) an oil very similar to oil of turpentine is obtained, which is used medicinally. The fibre of the leaves, mixed with wool or cotton, is woven in Germany into flannel, supposed to be beneficial to health.

**Pine-apple,** *Ananas sativa*, a native of tropical America, which has also been introduced into Asia and Africa. The fruit is exported from the Bahamas, the East Indies, and the Azores, and in the West Indies is often used to flavour rum. Certain kinds yield fibre. *See* **Pina Muslin.** Pine-apple oil is butyric ether, to which the fruit itself probably owes its flavour.

**Pinguin Fibre,** the fibre of *Bromelia pinguin*. *See* **Pita.**

**Pink Root,** the root of *Spigelia Marylandica*, a native of the southern United States, called also Worm Grass and Carolina Pink, and also of *S. anthelmia*, a native of tropical America. It is used as a vermifuge and a heart stimulant.

**Pins.** These small articles give rise to a considerable trade. They are manufactured in Birmingham, and in smaller quantities in London, Stroud, Warrington, and Dublin. Germany and France are also large manufacturers. In general needles and pins are made in the same places. In America they are made in the Atlantic States, chiefly in Connecticut.

**Pipes.** The most valuable pipes are made of meerschaum (*q.v.*). More in demand are briar pipes. *See* **Briar-root.** The cherry *Prunus Mahaleb* is grown in Southern Europe for pipe-stems and cigar-holders, having an aromatic odour. The industry is especially developed at Baden, south of Vienna, and in the Vosges Mountains. The common jasmin and the mock orange (*Philadelphus coronarius*) also furnish stems.

**Pippins.** The name of various kinds of apple, as Ribston, Newton, and Golden Pippins, and also used to denote apples cored and dried. Large quantities are prepared at Châtellerault and Saumur in France.

**Pistachio Nuts.** The *P. vera*, a small tree about 20 feet high, is a native of Syria and Persia, and is now cultivated in all parts of Southern Europe and the opposite coast of Africa. The kernels are eaten raw, and are used in confectionery. A burning oil is extracted from them.

**Pita.** A fibre obtained from certain *Bromelias* allied to the pine-apple. The name is also frequently given to the fibre of the American aloe. *See* **Ixtle.** Another name for it is *silk-grass*.

**Pitch.** The residue obtained from wood or coal-tar, petroleum, bone-tar, &c., the fire being withdrawn before the heavy oils begin to separate. Coal-tar pitch is employed in the manufacture of briquettes, in the preparation of black varnishes to protect iron and wood, and in the manufacture of lamp-black. The name pitch is also applied to the resin of various trees; Canada pitch is obtained from the Hemlock spruce (*Abies Canadensis*), Burgundy pitch from *Abies excelsa*, and Russian pitch from Scotch fir.

**Plaice.** This flat fish (*Pleuronectes platessa*) is found in the European seas from France up to Iceland, and is one of the commonest market fishes.

**Plane.** The wood of the plane (*Platanus orientalis*) is esteemed for cabinet-making work.

**Plaster of Paris.** Gypsum, or sulphate of lime from which the water has been driven off by heat. When water is added to it it again sets hard, and on this account it is used for making casts and for plastering purposes. France produces more than 60 per cent. of the world's supply.

**Plated Goods.** Various alloys of metal made into forks, spoons, ornaments, &c., are covered with a coating of silver or gold. The process now most commonly employed is a bath containing a weak solution of cyanide of silver in cyanide of potassium through which a galvanic current is made to pass from a positive electrode consisting of a plate of silver. Small objects can be coated by immersing them in a bath of cyanide of potassium and silver kept at boiling point. Formerly other processes were used, of which the best was that in which a sheet of silver was welded on to a sheet of base metal. Ornamental articles are often coated with an amalgam of quicksilver, and the quicksilver is driven off by heat. Birmingham, Sheffield, and Paris are the chief seats of the industry.

**Plate Glass.** Plate glass is formed by pouring liquid glass on to a table surrounded by a raised rim. It is then ground down with sand and polished, losing about half its weight. A large quantity is made in Belgium.

**Platinum.** A somewhat rare metal which generally occurs in the native state and alloyed with iridium, osmium, and other rare metals. In 1904, 149,676 oz. were obtained in Russia (Ural Mountains), 154,471 oz., in 1905; 9625 oz. in South America, chiefly Colombia, and small quantities in the United States, Spain, &c. Platinum is exceedingly malleable and ductile, has a very high fusing point, and cannot be dissolved by any single acid, but only by aqua regia. These properties render it suitable for crucibles, and it is also used to a limited extent in jewellery and for tipping gold pens. The tetrachloride is employed in chemical analysis. The average imports in 1902–4 into the United Kingdom were 72,402 oz. (£110,040), of which 72½ per cent. came immediately from Belgium, and nearly 24 per cent. from France.

**Plumbago.** *See* **Black-Lead.**

**Plums.** Plums either fresh or preserved in syrup are the object of a considerable trade between the southern and northern States of Europe. France and Algeria, Roumania and Bosnia supply large quantities. Some are also exported from the United States and the Cape. Among the best kinds are greengage (*Reine Claude*), magnum bonum, damson, and the small, round yellow wax plums, called *mirabelles* in France (*Prunus cerasifera*). The American cherry plum, or myrobalan, is often cultivated in Europe. *See* also **Prunes.**

**Plush.** A kind of cloth with a longer pile than velvet. It is generally made of silk, and is used for silk hats, ladies' dress, and furniture coverings.

**Podophyllum Resin,** the resin of *P. peltatum*, a plant common in North America, and of *P. emodi*, a native of the Himalayas, the latter yielding a larger quantity. The resin is an active cathartic.

**Polecat,** called also fitchet and foumart, an animal of the weasel tribe (*Mustela putorius*). The skin is sold in the north of Europe under the name of fitch, and is used as fur. The long black hairs make the best artists' brushes.

**Pollard,** or Sharps. Fine bran or husk of wheat.

**Pomegranate,** the fruit of *Punica granatum*, a low tree cultivated in the south of Europe, North Africa, and the warmer parts of Asia. A small quantity is exported to northern countries. The bark is used for tanning.

**Pomelo.** *See* **Shaddock.**

**Pongee,** a washing silk woven in Shantung, China, from the silk of the ailanthus silk-worm.

**Poonac,** a refuse cake left after pressing the oil out of coco-nut kernels. It is used for manure and feeding cattle.

**Poonga Oil,** or Kurunj. A fixed oil obtained from *Dalbergia arborea*, regarded in India as a remedy for skin diseases.

**Poplins,** cloth woven with a tight weft and a loose warp, so that the latter completely covers the former. Poplins are made of wool, a mixture of silk and wool, and cotton. They are manufactured at Lyons, at Roubaix, and other towns in the north of France, and in Ireland.

**Poppy.** The most important species is the White Poppy (*Papaver somniferum*), from which opium is made. The heads also are sold for use in pharmacy. Poppies are cultivated in France, Belgium, and Germany, and the oil from their seeds is used in cookery, and by painters and soap-boilers. Opium is also extracted from the Oriental poppy (*P. orientale*), which has bright red flowers.

**Porcelain.** *See* **Pottery.**

**Porcupine.** The quills of the common porcupine (*Hystrix cristata*) are used for penholders, and in fancy work. Some are exported from the Guinea coast.

**Porcupine Wood,** the outer, harder wood of the trunk of the coco-nut.

**Pork.** *See* **Swine.**

**Porpoise,** a genus of dolphins. The common porpoise is found on all the coasts of Europe and North America and in the Arctic regions. Oil of fine quality is obtained from the layer of fat beneath the skin, and the latter makes excellent leather. Much so-called porpoise leather is, however, obtained from the Beluga, or White Whale, of which many skins are sent to Europe by the Hudson Bay Company.

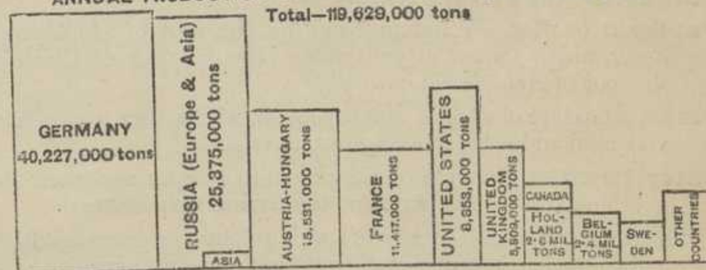
**Port,** a heavy red wine named from Oporto in Portugal, and grown in the Cima de Douro. About 10,800 thousand gallons are exported annually from Lisbon and Oporto.

**Porter,** a dark brown beer brewed from amber malt, with a small admixture of brown malt. The colour is rendered deeper by the addition of liquorice and caramel. Porter is chiefly brewed in Dublin. Stout is merely a stout, or strong, porter.

**Potash.** Chemically this word denotes the hydrated oxide of potassium. In commerce it is applied to the rough carbonate of potash obtained by burning wood and plants and then boiling the ashes. When refined it is often called pearl ash. Potash is also obtained in Germany from the chlorides of the Stassfurt mines, and from minerals in France and England. Beet sugar ash and wool scourings, or suint, are also a source of supply. Potash is used as a cleansing agent, as a chemical reagent, and in the manufacture of soap and glass.

**Potassium.** Besides potash, the bicarbonate of potash, bromide, chlorate, permanganate, sulphate, iodide, &c., are manufactured and sold. Chlorate of potash is employed in the manufacture of matches. A solution of the hypochlorite is sold as a bleaching agent under the name of Eau de Javelle. The sulphate is used as manure, and the chromate and bichromate in calico-printing. The bromide and iodide are used in photography, and, as well as other salts of potassium, in medicine.

**Potatoes.** The potato (*Solanum tuberosum*), a native of the Andes, is now grown in all temperate countries, and in one or two places even within the Arctic circle. It is extraordinarily productive, and can be profitably cultivated in cold climates where corn yields a very poor return. Potatoes are exported from France, Germany, the Canaries, and North America. In Russia, where they are cultivated largely in the west and centre, the tubers are used to a great extent for the manufacture of spirit and dextrine and gum, and in Holland the same manufactures are carried on.

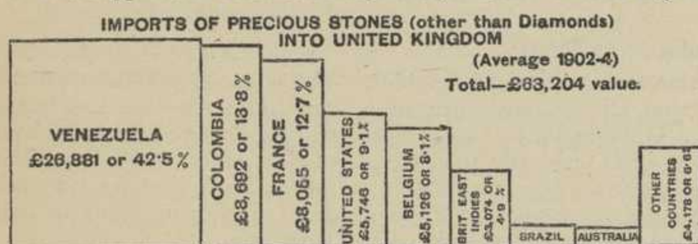



**Pottery.** This name includes earthenware which, exposed to a comparatively low heat, remains earthy in texture and is easily scratched with a knife; stoneware, heated to a considerable temperature and rendered dense and hard; and porcelain or

china, made of finely ground material and frequently decorated with great artistic skill. In the first two kinds various clays are used which may happen to occur in the neighbourhood of the factories, mixed with felspar, flint, or lime. Porous earthenware is frequently composed of clay only. The finer ware, porcelain, consists of a mixture of kaolin, sand, felspar, calcined bone, potash, granite, &c., in certain fixed proportion, each centre of the manufacture having its peculiar formula. These ingredients are ground down to exceeding fineness, and are glazed with various glazes adapted to their fusibility. Stoneware and earthenware pipes, flower-pots, jugs, jars, &c., are manufactured in many places where there is suitable clay and there is a demand for the goods. For table-ware china is now chiefly used, and is largely manufactured in the Potteries (Staffordshire), Montereau, Creil, Bordeaux, Tournay, and other towns. Artistic china is made at Worcester, Coalport, Derby, at Sèvres, Limoges, &c., at Meissen near Dresden, Munich, Vienna, Berlin, and Naples. Parian ware, white porcelain in the form of statuettes and other ornaments, is manufactured in the Potteries and at Paris. Eastern pottery is also prized, especially certain kinds of Japanese ware. England, France, Germany, and Holland export large quantities of pottery of various kinds, which are sent to North and South America, the colonies, &c.

**Poultry.** Fowls, ducks, geese and turkeys, pigeons, &c., are transported both alive and dead. The rearing of poultry for sale is common in all countries, but France, Russia, and Italy are the chief exporting countries, while Great Britain is the chief market for them.

**Precious Stones.** The most valuable—diamonds, emeralds, rubies, and sapphires—are entered separately. *See* also Plate 149.




**Prickly Pear,** or Indian Fig. The common Prickly Pear (*Opuntia vulgaris*), a plant of the cactus order, is a native of the southern parts of North America, and is now grown in the south of Europe and many warm countries. The fruit is exported in small quantities from the Mediterranean. The Tuna (*O. tuna*) of the West Indies also bears an agreeable fruit, and affords food to the cochineal.

**Printing Ink.** *See* **Ink.**

**Prunelloes,** prunes made of greengages and other fine-flavoured plums.

**Prunes.** These are plums, from a variety of the common blue plum-tree, dried in ovens. The best quality, the *prunes d'Ente*, are produced in the departments of Tarn, Lot, and Lot-et-Garonne, France. Tour prunes come from Vienne, Indre-et-Loire, and Maine-et-Loire, and guetches from Meurthe-et-Moselle. On the prunes of Provence the bloom remains after drying. Bosnia and Servia and California also export prunes, and Japanese plums, introduced into Algeria, produce good prunes. In the years 1902–4 the average imports into the United Kingdom of French plums and prunelloes was 18,160 cwts. (£44,833), almost all from France, while 35,581 cwts. of ordinary prunes, worth £50,124, were imported, more than 72 per cent. from the United States.

**Prussian Blue,** Sesquiferrocyanide of iron used by laundresses. Called also Berlin blue.

**Pulque,** a fermented beverage made in Central America from the juice of the Agave.

**Pulu Fibre,** the silky hairs of a tree-fern (*Cibotium*) shipped from the Sandwich Islands, Azores, West Indies, and Canaries, for stuffing pillows, &c. *See* also **Paku Kidang.**

**Pumice,** highly porous and cellular lava, which is used for polishing wood, ivory, metals, glass, &c., and for preparing parchment and leather. Large quantities are exported from the Lipari Islands.

**Purguera.** *See* **Physic Nuts.**

**Putchuk,** or Kut, an Indian name for the root of *Aucklandia costus*, which resembles orris root. The putchuk of China is the root of *Aristolochia recurvilabra*.

**Putty,** a mixture of whiting and drying oil, which after a time sets very hard and is used to fix in panes of glass.

**Putty Powder,** binoxide of tin ground to powder and used for polishing stone, glass, &c., and for making white enamel.

**Pyrites,** ores of metals combined with sulphur or arsenic. Iron and copper pyrites are largely used in the manufacture of sulphuric acid, green vitriol, and alum. *See* **Sulphur.**

**Quail,** a bird of the partridge family, found in South Europe, North Africa, Asia, Australia, and America. Large numbers are netted in the South of Europe, especially on Capri in the bay of Naples, and in Egypt. The American quails include a very large number of species.

**Quassia.** The *Quassia amara* of tropical America yielded originally the quassia wood used in medicine, but now the name is usually given to Bitterwood (*q.v.*). The *Simaruba officinalis* of Guiana and the *S. excelsa* of Jamaica contain the same bitter principle.

**Quebracho.** There are several species of this tree growing in South America. The bark of the white quebracho (*Aspidosperma*) is bitter, and is used medicinally in cases of intermittent fever. For tanning the bark of *Quebracho colorado*, a tree of a different family, is used, and it also yields a dye.

**Quercitron,** the bark of the yellow or Dyer's oak (*Quercitron tinctoria*) of North America. The best is shipped at Baltimore. With different mordants it dyes wool, silk, and cotton yellow, olive-green, grey, or black. An extract called flavine is extensively employed.

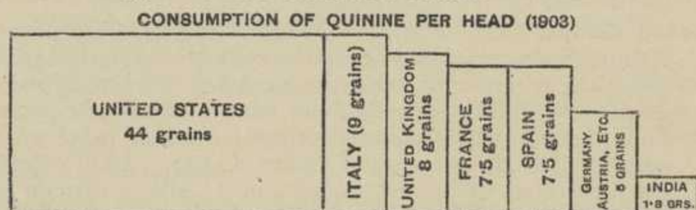
**Quicksilver.** *See* **Mercury.**

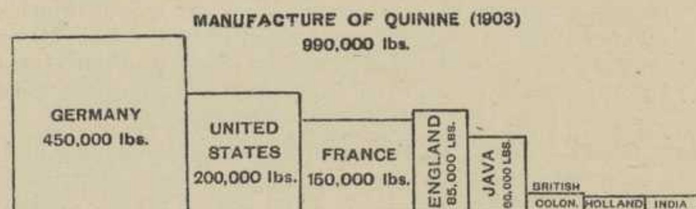
**Quillaja Bark,** the bark of *Quillaja saponaria*, a large tree of the Rosaceæ order, which grows in Chile, Peru, and Bolivia. The bark is often sold as Panama bark, and is used in cleaning dyed woollen and silk articles, as it does not disturb the colour.

**Quills.** The quills of geese, swans, and turkeys are still prepared for writing, though superseded to a large extent by metallic pens. Crow quills are used for fine writing and drawing. Germany, Bohemia, Poland, and Russia deal in quills, and large quantities are brought from the Hudson Bay Territory. They are also made into toothpicks.

**Quince.** The common quince, *Cydonia vulgaris*, a native of the south of Europe and the temperate countries of Asia, is a low tree, bearing fruits rather rounder than a pear, and of a yellowish colour. Jelly and marmalade are made of the fruit. The seeds, which are very mucilaginous, are used in medicine, and in the preparation of bandoline.

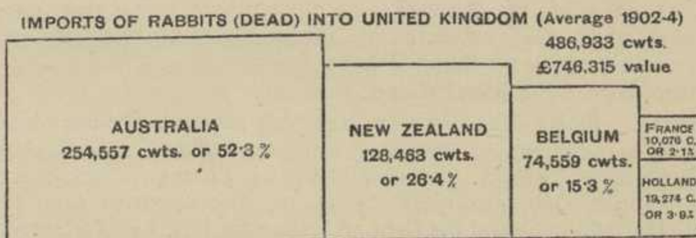
**Quinine.** Quinine is an alkaloid contained in cinchona bark (*q.v.*). It is most frequently used as medicine, and is exported in the form of sulphate. Quinine is manufactured chiefly in Germany, the United States, and France.




**Rabannas,** matting made of Raphia fibre, which is exported from Madagascar.

**Rabbits.** Besides wild rabbits, shot in the fields, many come to market from artificial warrens. Large numbers are fattened in Germany, many of which are exported through Belgium. From Australia and Tasmania hundreds of thousands have been sent to Europe in refrigerating chambers. Still larger numbers of skins are annually sold for their fur, which is used in the manufacture of felt hats, and is converted into imitations of more expensive furs. Besides Australia, Russia and Poland supply rabbit skins, and North America a small kind of less value.




**Racoon,** a small animal of the bear family, *Procyon lotor*. The skins were formerly exported from North America in large numbers, but now they are become very scarce.

**Rafia.** *See* **Raphia.**

**Ragi,** Indian name for the grass *Eleusine corocana*, cultivated as a cereal, particularly in Mysore.

**Rags.** Though wood-pulp, esparto, and other materials have been introduced, rags are still used in the manufacture of fine and strong papers, and are mixed with other material to make inferior paper. Woollen rags and old clothes are worked up in shoddy mills into coarse flannels, druggets, &c. Rags are a not insignificant article in international trade.

**Rails.** Rails for railways are made of steel or iron. Great Britain, the United States, and Germany are the chief producers, the first exporting considerably more than the other two countries together (546,569 tons in 1905, worth £2,731,854).

**Raisins,** dried grapes, exported from the south-eastern provinces of Spain, the neighbourhood of Marseilles, the south of Italy, Turkey, and Asia Minor. Currants, cultivated in Greece and the Ionian Islands, are a small variety of grape. Raisins are also dried in California. The best raisins are the muscatels of Malaga. The sultanas of Smyrna, having no seeds, are esteemed for confectionery. The imports into the United Kingdom for the years 1903–5 averaged 717,027 cwts. (£1,039,684), of which more than 94 per cent. came from Asiatic Turkey and Spain.

**Ramie.** *See* **Grass Cloth.**

**Rampur Shawls.** *See* **Shawls.**

**Rape,** *Brassica napus*, or coleseed, an annual plant, cultivated for its herbage and for its oil. The name rape oil is also given to colza oil extracted from *Brassica campestris*, a plant largely grown in India. The cake from rape seed is inferior to linseed and other oil-cakes. 12,065 tons of rape-seed oil, worth £267,499, were imported in 1904.

**Raphia,** *Raphia vinifera*, a palm growing in Madagascar, West Africa, and Polynesia, yields a fibre which is woven into bags, window-blinds, and tissues mixed with silk, and is made into cigarette paper. The fibre of the Jupati palm of the Amazons (*R. tædigera*) is used for similar purposes, and by gardeners for tying up plants.

**Rattans,** the stems of *Calamus rotang*, *C. viminalis*, and other closely-allied palms yield the rattan canes from which baskets, lattice-work, brooms, chair bottoms, and other articles are made. They are largely exported from the East. Malacca canes are the stems of *C. scipionum*, which grows in Sumatra.

**Ray Skins.** *See* **Shagreen.**

**Realgar,** Bisulphide of arsenic, which occurs in nature and is one of the ores from which arsenic is obtained. Like orpiment, it is used as a pigment.

**Red.** For vegetable red dyes, *see* **Brazil Wood, Sandalwood, Safflower, Madder**; for animal **Kermes, Carmine** and **Cochineal. Ochres** (*q.v.*) are red pigments due to the presence of oxides of iron. *See* also **Vermilion, Aniline,** and **Phenol Dyes.**

**Red Root,** the root of *Ceanothus Americanus*, which grows in Canada and the United States, is used to dye wool a cinnamon colour.

**Reindeer.** Reindeer tongues are exported from Russia, and the horns are sometimes sent to market. The reindeer, *Rangifer tarandus*, is found in Northern Europe, Asia, and America. The female also bears antlers, which is not the case with any other species of deer.

**Reindeer Moss,** a lichen, *Cladonia rangifera*, used to a small extent by bird-stuffers to ornament cases.

**Rep,** a strong worsted fabric made for covering furniture.

**Resins,** vegetable products composed of carbon, hydrogen, and oxygen. Common resin, or rosin, exudes from the trunks of various kinds of pine, and has to be freed from its turpentine. It is used in making common yellow soap, sizing paper, &c. For other resins, *see* **Anime, Copal, Dammar, Mastic, Lac, Kauri Gum,** &c.

**Rhatany Root,** or Ratanhia, the root of a shrubby plant, *Kraméria triandra*, which grows on the cold tablelands of South America. The best comes from Peru. It is a powerful astringent, and is used in medicine. Powdered, it forms a dentifrice.

**Rhea Fibre.** *See* **Grass Cloth.**

**Rhinocerus.** Species of this animal are found in Southern Asia and in Africa. The hide is manufactured into shields, whips, &c., but the horns are the principal articles of commerce. They are formed into cups, handles for sticks, whips, umbrellas, &c.

**Rhubarb.** The root of *Rheum officinale* and other varieties is dried and exported from China to Europe, where it is used as a medicine. It is generally known as Turkey rhubarb, because it was formerly introduced into Europe through Turkey. A considerable quantity is now grown in England, France, Germany, and other European countries, and this rhubarb cannot easily be distinguished from the Eastern article.

**Ribbons.** Ribbons are usually manufactured of silk, mixed silk, and velvet. The chief seats of the manufacture are St. Etienne in France, Crefeld, Basel, Vienna, and Coventry. France and Germany are large exporters.

**Rice.** *See* Plates 72, 73.

**Rice Paper,** the pith of *Aralia* (*Fatsia*) *papyrifera* cut spirally and opened out into a flat sheet. It is made in China, and used to make coloured drawings on, for artificial flowers, &c.

**Rochelle Salt,** tartrate of soda and potash, which acts as a mild aperient, and is an ingredient of some Seidlitz powders.

**Rock Alum,** or Alumite. A mineral composed of sulphate of potash and sulphate of alumina, from which alum is obtained. It occurs at Edessa, Tolfa near Civita Vecchia, in the Auvergne, Hungary, &c.

**Rock Salt.** *See* **Salt.**

**Rogue.** *See* **Cod.**

**Rohun Bark,** Indian name for the bark of *Soymida febrifuga*, a bitter astringent.

**Room,** a blue dye, little inferior to indigo, derived from the leaves of the Indian plants *Ruellia comosa* and *R. indigotia*.

**Rope.** The principal materials used for the manufacture of ropes are manila hemp, sisal hemp, coir, sunn hemp, and New Zealand hemp, all which are described separately. There are numbers of other fibres used locally or in smaller quantities.

**Rose Malloes,** a corruption of the Malay name for liquid storax, an exudation from *Liquidambar altingia* of Java and Tenasserim, and of *L. orientale* of Rhodes.

**Rosemary.** This shrub, *Rosmarinus officinalis*, contains an essential oil, which, as well as a distilled spirit, is used in liniments and perfumery. The south of France, Italy, and Spain are the chief countries of origin.

**Rose Oil.** *See* **Attar of Roses.**

**Rosewood,** the wood of varieties of Dalbergia and Jacaranda growing in Brazil and the adjoining countries. The best is exported from Bahia and Rio de Janeiro. Somewhat inferior in veining are *D. latifolia*, *D. sissoo*, and *D. cultrata* of India, also frequently called Blackwood. An inferior rosewood is exported from Honduras.

**Rosin.** *See* **Resin.**

**Rosoglio,** liqueur made in Italy and flavoured with fruits and flowers, especially orange flowers.

**Rotten Stone,** a soft stone, consisting of alumina with 10 per cent. of carbonaceous matter and a little silica. It occurs in Derbyshire, in Wales, and near Albany in the State of New York. It is used for cleaning metals and for other purposes to which tripoli also is applied.

**Rouge.** Rouge for the skin is made of carmine or vermilion mixed with French chalk and sometimes a little oil. Jewellers' rouge is a red preparation from oxide of iron, and is used for polishing silver. Inferior varieties are also sold.

**Rove,** the oak gall formed on *Quercus infectoria*.

**Ruby.** This stone is a clear corundum of a red colour. The chief mines are in Upper Burma, where the pigeons' blood stones are found. Siam produces stones of an inferior quality, and rubies occur in Borneo. In Ceylon purplish rubies are found. The finest ruby belongs to the Shah of Persia, and weighs 175 carats. Spinel is a stone composed of a double aluminate of magnesia and silica with traces of iron, and is a little less transparent than the oriental ruby. When rose-red in colour it is called Balas ruby.

**Rue.** The common garden rue (*Ruta graveolens*) contains an acrid volatile oil, which is administered in syrup as a medicine.

**Rum,** a spirit made wherever sugar-cane is grown. The best is made from the skimmings of the sugar pans and the lowest quality from molasses. Sometimes pineapple and guava are used to flavour the spirit. Jamaica rum is most esteemed, and then Demerara. The spirit is also exported from the French West Indian islands. In 1904 the imports of rum into the United Kingdom exceeded 4 million proof gallons.

**Rusa Oil,** an essential oil obtained in the East Indies from *Andropogon Schœnanthus*. *See* **Grass Oils.**

**Rusaut,** a medicinal extract from the bark and wood of an Indian barberry, *Berberis aristata*.

**Rush.** The common rush (*Juncus conglomeratus*) and the soft rush (*J. effusus*) are used for the seats of chairs, mats, &c., and the latter is cultivated in Japan. The pith is sometimes made into wicks. Rush hats of *Cyperus tegetiformis* are exported from China to Europe. *See* also **Dutch Rushes.**

**Russia Leather.** *See* **Leather.**

**Rye.** *See* Plates 72, 73.

**Sabadilla Seeds,** the fruits of *Schœnocaulon officinale*, a Mexican plant, from which an alkaloid, veratrine, is extracted and administered in cases of rheumatism and neuralgia. It is cultivated near Vera Cruz, and large quantities are exported from Venezuela.

**Sable.** This animal, *Martes zibellina*, a species of marten, is a native of Siberia, and furnishes one of the most valuable furs. Skins being demanded by the Russian government as a tax, the sable has become scarce in many parts of the country. *See* also **Alaska Sable** and **Marten.**

**Saccharine,** a sweet substance prepared from coal-tar. It has great sweetening powers, and is used by brewers, and in the manufacture of preserves, &c., and by invalids as a substitute for sugar.

**Sacks.** Sacks are made of hemp, jute, and other coarse fibres to hold flour, grain, hops, &c., and are exported from European countries to the colonies for packing sugar, cocoa, coffee, pepper, &c.

**Saddlery.** Saddles, harness, and other horse-gear are included under this name. The finest articles, for carriage and riding horses, are manufactured in England.

**Safflower,** *Carthamus tinctorius*, a plant of the order Compositæ, which is cultivated in Spain, Southern Germany, Egypt, Persia, the East Indies, and Central America, for the sake of the dye yielded by its flowers. By treating the flowers with an alkaline solution a fine red dye called carthamine is obtained. Persia and Bengal produce the best safflower. Aniline has almost driven this dye-stuff out of the market.

**Saffron,** the dried stigmas of *Crocus sativus*, which yield a yellow dye. The plant is cultivated in several countries of Europe, the East, and America, but as a dye it is no longer important. In India and Persia it is largely used as a condiment. Of European countries Spain produces the most, and Lower Austria the best quality.

**Sagapenum,** a resinous exudation from *Ferula Persica*, in yellowish, brownish, or reddish grains. It is prescribed for the same purposes as asafœtida.

**Sage.** The leaves of the common sage (*Salvia officinalis*) are an article of commerce. They contain an essential oil, sometimes used as a remedy for rheumatism. *S. pomifera*, which grows in the south of Europe and the Levant, bears gall-nuts made in Crete into sweetmeats.

**Sago.** *See* Plate 76.

**Saké,** a Japanese spirit made from rice.

**Sal,** an Indian tree, *Shorea robusta*, the wood of which is inferior only to teak. Its resin is used locally as a substitute for dammar.

**Salad Oil.** Generally supposed to be olive oil, but cotton-seed, poppy, and many other oils are sold under this name, and are often mixed with olive oil.

**Sal Ammoniac,** ammonia hydrochlorate. This salt occurs on the fissures of the lavas of Vesuvius and Etna, and in Bukhara; most, however, is prepared artificially from the ammoniacal liquor of gas works. Its chief applications are in the manufacture of colours, oil-cloths, in tinning metals, and in soldering.

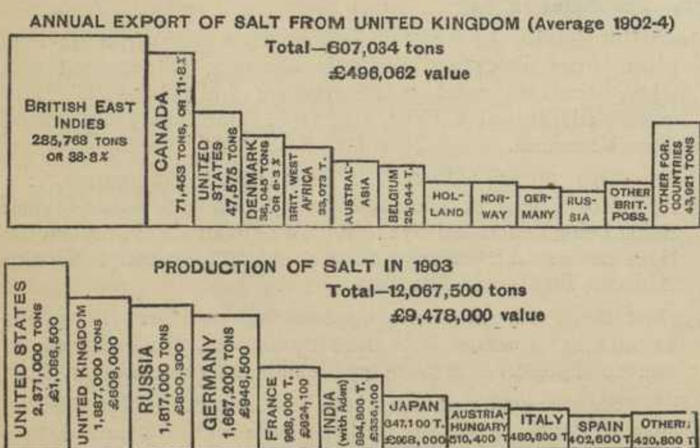
**Salep,** the dried fecula of several species of orchis, especially *O. morio, O. mascula, O. militaris*, and *Anacamptis pyramidalis*. Western Germany and France produce salep, but most comes from Smyrna. Mixed with water, sugar, and milk it makes a good diet drink. In India salep is said to be made from a species of *Eulophia*.

**Salicin,** a glucoside obtained from the bark of various species of willow and poplar. It occurs in small white crystals, very bitter to the taste. It is administered as a substitute for quinine, as a stomachic, and a remedy for chronic catarrh.

**Salmon.** The European salmon (*Salmo salar*) is found in all the waters of Europe as far south as the Loire. It is fished on the shores and in the rivers of Norway, Great Britain, and Iceland, in the Rhine, the Elbe, and the Weser, and is eaten fresh, smoked, and salted. The salmon of the Atlantic coast of America is caught as far south as the Hudson River, and is of the same species as the European fish. The salmon of the Pacific coast is able to bear a higher temperature, and differs in many other respects from the European species. The King or Quinnat salmon of Alaska (*S. quinnat*), the Humpback salmon (*Oncorhynchus gorbuscha*), and the red salmon (*O. nerka*) are the most abundant. Salmon are caught in large quantities and tinned on the Columbia River, Oregon, the Fraser River, British Columbia and Alaska, where Kodiak I. is a great canning station.

**Sal Prunelle,** purified nitre, in flat round cakes and small balls. *See* **Saltpetre.**

**Salt.** Chloride of sodium, or common salt, occurs in the form of rock salt, or in brine springs, in many countries of Europe, the most noted mines being those of Wieliczka in Galicia. In Spain, Italy, and France salt (bay salt) is also obtained by evaporating sea-water. There are mines in the salt range of India, and evaporating basins have been constructed along the coast, but the local manufacture has to be supplemented by importation. The United States is also an importing country, though large quantities of salt are worked in the States of Michigan and New York, and some in other States. Great Britain, France, and Spain are the principal exporting countries. About twelve million tons are manufactured annually throughout the world. Salt is largely used in preserving meat, fish, and other provisions, and from it the other salts of soda are manufactured. Spirits of salt is a name for muriatic acid.




**Salt Cake.** Sodium sulphate, made from common salt in the process of manufacturing sodium carbonate.

**Saltpetre.** Nitrate of potash, or nitre, occurs as an efflorescence from the soil in India and Persia, and in Prussia, Switzerland, and Sweden is obtained by mixing urine, dung, and animal offal with lime, débris from buildings, &c. Most saltpetre, however (except what is exported from India), is now made from nitrate of soda (*see* **Nitrate**), which is often called Chilian saltpetre. Nitre is employed in the manufacture of nitric and sulphuric acids, in medicine, and especially in the manufacture of gunpowder.

**Samshu,** a spirit made in China from rice, identical with the Japanese saké.

**Sandalwood,** the wood of several species of the genus Santalum, which grow in India, Further India, and the Malay Archipelago. Sandalwood is compact and fine grained, and has a very agreeable perfume. It is used for carved goods and other ornamental articles, and is burned in Indian and Chinese temples. The most common is White Sandalwood (*Santalum album*), but the woods of other species growing in New Caledonia and Australia are now brought into the market. The sandalwood of *Fusanus spicatus* and *F. acuminatus* from Western Australia have little odour. From the chips a very valuable oil is manufactured in England and France for the preparation of perfumes. Red Sandalwood is a tree of a different order, *Pterocarpus santalinus*, of the East Indies and Philippines. The red heartwood colours cloth a pale pink, and forms the basis of some tooth-powders.

**Sandarac,** a resin obtained from the bark of *Callitris quadrivalvis*, a conifer that grows in North Africa. It is exported chiefly from Mogador. It is used, like mastic, in the preparation of varnishes, and in powder is rubbed on erasures on writing-paper.

**Sanderswood,** a red dyewood exported from Madras. It is another name for red sandalwood.

**Santonin,** a crystalline extract from the dried flowers of *Artemisia maritima*, var. *Stechmanniana*, a plant which grows abundantly in Russia. Santonin is a powerful medicine for worms.

**Sappan Wood,** the red wood of *Cæsalpinia sappan*, a native of India, which yields a dye largely used in calico printing.

**Sapphire.** Clear blue crystals of corundum. The finest stones come from Ceylon, and a few from Kashmir and Burma. Queensland, Australia, and Montana, U.S.A., also yield stones.

**Sapucaya Nuts.** *Lecythis zabucajo*, a tree allied to the Brazil-nut, which grows in Guiana and Brazil, bears fine-flavoured nuts. In Brazil a much prized oil is expressed from them. Rope is made from the bast.

**Sarcocolla,** gum obtained from *Penæa sarcocolla* and *P. mucronata*, natives of North Africa, Arabia, and Persia.

**Sardines.** The French name for small pilchards (*q.v.*). They are preserved in tins, and an oil is expressed from them. Other small fish, sprats and young herrings for instance, are often tinned as sardines.

**Sarsaparilla.** The roots of several kinds of *Smilax* are exported from the West Indies, Central America, Peru, and Ecuador. In the British Pharmacopœia they are called Jamaica sarsa parilla. A decoction and extract are used in medicine. *S. aspera* is grown in the Mediterranean, and is known as Italian sarsaparilla, and *S. China* is much esteemed in the East. German sarsaparilla, from *Carex arenaria*, is little used at the present day. Indian sarsaparilla is the roots of *Hemidesmus Indicus*.

**Sashes.** These are exported ready made from Sweden and the United States.

**Sassafras.** The American tree, *Sassafras officinale*, of the order Lauraceæ, grows from Canada to Florida. The wood, but more particularly the root-bark, is used in medicine as a powerful stimulant, and also the volatile oil of sassafras. The last is employed in perfuming soap and to adulterate copaiva balsam. The wood is worked by turners. *S. parthenoxylon* grows in Sumatra, and the name sassafras is given to *Atherosperma moschata* and various trees in Australia. Sassafras nuts are the fruit of another tree of the same order, *Nectandra puchury*, and are also known as Pichurim beans and Brazil beans. They somewhat resemble nutmegs in their aromatic properties, and are used as a substitute for vanilla in flavouring chocolate.

**Satin,** a silken fabric in which the threads of the weft pass under comparatively few threads of the warp, so that the surface has a glossy appearance. The number of warp threads that appear

on the surface is sometimes only one in ten, sometimes as many as one in four, and then the fabric is sometimes called satinet. Cotton fabrics similarly woven are called sateens.

**Satinwood.** There are two kinds of satinwood, of which one is obtained from *Chloroxylon Swietenia*, growing in India and Ceylon. The other, and more valuable, is derived from *Maba Guianensis* in the Bahamas. Ships' cabins are often panelled with satinwood.

**Sausages.** Sausages are manufactured in many towns in Germany, at Bologna and Trient, at Bayonne, Lyon and Arles, and in the United States. Salted, smoked, or mixed with spices they will keep good for some time, and the United States and other countries export sausage and sausage meat. Australia and America export large numbers of sausage skins.

**Sauternes,** excellent white wines produced in Sauternes and the neighbouring communes of the department of La Gironde, France.

**Savine,** or Savin, a low shrub, *Juniperus sabina*, grows in the mountains of Central and South Europe, the Caucasus and North America. The tops yield a volatile oil used in medicine. The oil from *J. Virginia*, which also grows in North America, is less abundant.

**Sawdust.** This refuse is turned to a multitude of purposes. In its original state it forms the stuffing of dolls and pin-cushions and a filtering material, and the dust of mahogany and rosewood is used in dressing furs. From the small fragments of aromatic woods perfumes are extracted. Fine sawdust of rosewood, ebony, and other choice woods is formed into a paste with blood and moulded into ornaments. In chemical works sawdust is used in the manufacture of soda ash, and is a source of oxalic acid.

**Scaleboard.** A veneer or thin sheet of wood.

**Scallops.** Various species of *Pecten*, a well-known mollusc, are eaten, especially in America. Some of the larger kinds are frequently called clams (*q.v.*).

**Scammony,** a gum resin of a grey colour obtained from the roots of *Convolvulus scammonia*, which grows in the Levant, particularly in the neighbourhood of Smyrna and Aleppo. When pure it is an excellent cathartic medicine.

**Scarlet Runners.** *See* **Beans.**

**Scoured Wool.** *See* **Wool.**

**Scrap Iron.** Old or waste iron material sold to be remelted.

**Screw.** Wood screws are cut by machinery out of mild steel and iron, brass, copper, and zinc. They are made in large quantities in Birmingham, and are exported. Germany and the United States are also considerable manufacturers.

**Scrivelloes.** *See* **Ivory.**

**Seal.** Seals are divided into two families, the Phocidæ, which have no external ears, and the Otariidæ, in which there are distinct, though small, outer appendages. Of the Phocidæ, the common seal (*Phoca vitulina*), which occurs in Greenland, on the Arctic shores of North America and in the North Pacific, the Harp Seal (*P. Grœnlandica*), abundant in Newfoundland and Greenland, are most hunted for their oil and skin, the coat being however of a hairy texture and therefore much less valuable than that of the fur seals. Other kinds are much sought after by Eskimos and Greenlanders, and the seals of the Caspian Sea and Lake Baikal are hunted by the natives. The sea-elephant of the Antarctic (*Macrorhinus leonina*) is hunted for its blubber and skin, and another species (*M. angustirostris*) occurs in the North Pacific, but is now scarce. To the sea-lions, of the Otariidæ family, belong the *Otaria Stelleri* of the northern hemisphere, and the *Otaria jubata* of the southern. The fur seals proper comprise the *Callorhinus ursinus* of the North Pacific, and the *Arctocephalus nigrescens* of the South Atlantic and Antarctic. Another species, *A. pusilla*, is almost extinct. A large quantity of hair is mingled with the fur of the southern seal, which, however, can be removed. The numbers have diminished very rapidly. In the northern hemisphere fur seals are taken at the Pribylof Islands, the Commander Islands, and Robben Island, and in the open sea. At the Pribylof Islands the catch in 1904 was only about 13,000 skins. In the southern hemisphere the most abundant supply is obtained from Lobos Island, at the mouth of the Rio de la Plata. About 15,000 to 20,000 skins are taken annually off South America. London is the great market for the skins. For other seals the most important fishing ground lies to the east of Newfoundland and Labrador. Very few skins and little oil are now obtained from the Antarctic regions. *See* Plate 124.

**Sealing-Wax.** The best kind is made of 5 to 6 parts of shellac, and 3 to 4 each of Venice turpentine and vermilion, to which is frequently added some magnesia, chalk, or gypsum. In commoner kinds there is less shellac and vermilion. Bottle wax is composed principally of resin, turpentine, and chalk.

**Sea Morse Teeth.** *See* **Walrus.**

**Seaside Grape,** *Coccoloba uvifera*, a small tree that grows in the West Indies and South America. The wood is heavy, beautifully veined, and takes a good polish. An extract from it is extremely astringent, and is sometimes called Jamaica Kino.

**Sea-Weeds.** For the utilisation of sea-weeds in industry, *see* **Agar-Agar, Barilla, Kelp,** and **Iodine.**

**Seconds,** an inferior quality of flour.

**Seed-Lac.** *See* **Lac.**

**Seeds.** The grains of many plants are articles of commerce either for the extraction of oil, as flavouring agents, or as food for cattle, birds, &c. The chief of these are linseed, cotton-seed, hemp-seed, canary-seed, grains of Paradise, ajowan seeds, aniseed, fennel-seed, sunflower seed, &c., all which are entered separately. Large quantities of the expressed oils are also dealt with in international commerce.

**Seidlitz Powders.** These powders derive their name from a village in Northern Bohemia, where there is a spring of water containing similar ingredients. They usually contain 120 grains of tartrate of soda and potash, and 40 grains of bicarbonate of soda in one paper, and 38 grains of tartaric acid in another. When the contents of the two papers are mixed together in water carbonic acid is liberated, causing effervescence.

**Selenite,** a transparent gypsum. Fine crystals are found at Bex, in Switzerland, in Sicily, Nova Scotia, and New Brunswick. Thin plates are used in polarizing apparatus. Selenite also makes the finest plaster of Paris, being a very pure form of gypsum.

**Selenium,** a rare element occurring sometimes in a vitreous form. It is a non-conductor of electricity, but its resistance is less in the light than in the dark, and this property is utilised in the photophone. It can be employed in the colouring of glass, but its great rarity and consequent high price are a check to its use.

**Seltzer Water.** *See* **Mineral Waters.**

**Semencine,** or Semen-contra. Dried flowers of Artemisia exported from Aleppo, Alexandria, and North Africa. *See* **Santonin.**

**Semolina.** Granules of the floury part of wheat. Italy exports large quantities, and France manufactures semolina of a superior quality, made from hard wheat. The name is also given to the larger grains produced in the process of milling, cleaned and sold, instead of being ground into flour. Semolina is used in soups and puddings.

**Senega Root.** The roots of a bush (*Polygala senega*) which are exported from North America. The bush is also very abundant at the Cape. A medicine is extracted from them.

**Senegal Gum.** Gum arabic from the Senegal River, where *Acacia verek*, *A. Adansonii*, *A. albida*, &c., grow.

**Senna.** The dried leaflets of several species of Cassia. Alexandrian senna is the leaves of *C. acutifolia*, and Tinevelli of *C. angustifolia*. The leaves of *C. obovata* are also used and frequently mixed with the other kinds. A confection, infusion, syrup, and tincture are used in medicine, and senna is an important ingredient in "black draught."

**Sepia,** a brown pigment prepared from the colouring matter in the ink bag of the cuttle-fish, particularly *Sepia officinalis*, caught chiefly in the Adriatic and Mediterranean. It forms a good watercolour.

**Serpentary Root.** The Virginian snake root, *Aristolochia serpentaria*. It possesses stimulant and tonic properties.

**Serpentine,** a stone which in its purest form is a magnesium silicate. Noble serpentine has a rich dark-green colour and receives a good polish. Vases and boxes, &c., are made of it. It is found in several parts of Germany, at Epinal in France, in Banffshire, the Shetland Islands, and Cornwall, but fine pieces are rare.

**Serpolet Oil.** The oil from *Thymus serpyllum*. *See* **Thymol.**

**Sesame.** The seeds of *Sesamum Indicum* and other species, which are cultivated throughout the East and in all tropical lands. Gingelly oil extracted from them is used, like olive oil, in cookery and also as an illuminant and lubricant. Sesame, called also gingelly and til-seed, is exported from India to Europe to the value of about £1,400,000 annually.

**Seville Orange.** *See* **Orange.**

**Sewing-Machines.** Machines to a considerable value are exported from the United States and Great Britain. The Singer Manufacturing Company has factories at Elizabethport, New Jersey, at Kilbowie, near Glasgow, at Vienna, and in Canada, and the main factory of the Wheeler & Wilson Company is at Bridgeport, Connecticut.

**Shabrack,** a large saddle-cloth for cavalry horses, made of sheepskins with short curly wool.

**Shad.** Shads are large fishes of the herring family. The common shad (*Alosa communis*) and the Twaite shad (*A. finta*) abound in European waters and ascend the rivers. Several species are found in America, and the *Alosa sapidissima* is very abundant and is successfully hatched in the government establishments.

**Shaddock,** a member of the orange family, *Citrus decumanus*, which is a native of the East and is now grown in the West Indies and Florida, and in Southern Europe. A finer and smaller variety is called pomelo or pompelmoose (Fr. *pamplemousse*), or grape-fruit.

**Shagreen.** The skins of rays, sharks, and other similar fishes. Being covered with grains of dentine they are used for smoothing wood. They also make durable leather, called in France *galuchat*, and are used to cover caskets, small boxes, and instrument cases. Real shagreen, however, is dear, and the pieces are of small size. Imitation shagreen is manufactured from ox skin by pressing into it seeds of a *Chenopodium* so as to give it a pitted surface.

**Shale Oil,** a petroleum distilled from shale. The Scottish shale oil industry is important, and shale is worked in New South Wales and New Zealand. *See* **Petroleum** (Plate 152).

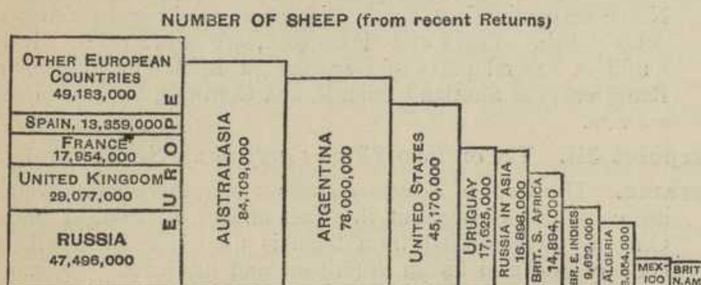
**Shark.** Sharks are valuable for their skins and livers. Formerly the skins were used as shagreen to polish wood, and a considerable quantity of oil is obtained from their livers. The species chiefly used for this purpose are the ground shark which inhabits northern waters southwards to France, Massachusetts, and Oregon; the basking shark (*Selache maxima*), taken in the north of Europe and on the coasts of California, Peru, and Australia; the oil-shark (*Galeorhinus*) of the Pacific coast of North America; and the dog-fish. Skates, rays, and saw-fish also yield oil. Shark oil is very good for illuminating purposes, and is used in tanneries and in steel-tempering. As a strengthening medicine, it is said to be quite équal to cod-liver oil. Sharks and dog-fish are utilised to a small extent as food, and the fins are imported into China, where gelatine is made from them.

**Shawls.** The finest shawls are made in Cashmere from the *pash* or under wool of the Cashmere goat (*see* **Cashmere**), one of first-rate quality being worth £300. Inferior shawls are manufactured in the Punjab, and Rampur shawls are well known. In Kerman, Persia, shawls are woven of the wool of the Angora goat (*see* **Mohair**), but these are not equal in quality to those of Cashmere. These industries have seriously declined now that shawls have gone out of fashion. Shawls are still manufactured in Europe to a certain extent at Rheims and Chantilly, in Picardy, and in Austria, being still worn in Brittany and the Mediterranean, and plaids are made in Scotland, in Belgium, and at Rheims.

**Shea Butter,** the solid fat obtained from the seeds of *Butyrospermum Parkii*, eaten as butter on the west coast of Africa, and exported for soap-making.

**Sheep.** Sheep are kept either for their flesh or for their wool. Black-faced sheep and Cheviots are hardy breeds, South Downs and Cotswolds produce the best mutton, and Lincolns are one of the best long-woolled sheep. The finest of all wools is that of the merino sheep, originally a Spanish breed, but now widely distributed in Australia, North America, and Argentina. New Zealand, where the meat is an important product, rears Lincolns, Leicesters, and Cotswolds. The Astrakhan or Bokharian sheep is well known for its curly wool. The total number of sheep throughout the world is more than 400 millions, Australasia, Argentina, and Russia in Europe containing the largest number. North America and Argentina export large numbers of live sheep and frozen meat and wool, New Zealand frozen meat, especially Canterbury lamb, and also a large quantity of wool, and Australia is chiefly famous for the latter article. Sheep-skins are exported from South Africa, Australia, Argentina, &c. *See* also **Meat** (Plate 65).

NUMBER OF SHEEP (from recent Returns)




**Sheet Glass.** *See* **Glass.**

**Sheetings,** bleached or unbleached linen cloth for sheets. Cotton is warmer, and cotton sheetings are now extensively manufactured.

**Sheets.** *See* **Tarpaulin.**

**Shellac.** *See* **Lac.**

**Shell-fish.** *See* **Lobsters, Oysters,** and **Clams.** Crabs, mussels, and cockles are less important kinds, but are used to some extent as food. Mussels are sold as bait.

**Shells.** *See* **Cowries, Pearls, Chanks,** and **Conchs.** Various other shells are employed for ornamental purposes.

**Sherry,** a dry white wine named after Xerez in Spain. *See* **Wines.**

**Shingles,** flat pieces of wood used as tiles for roofing houses. Shingles are used in many parts of the European continent and frequently in America, especially in the Pacific States, where the manufacture is an important branch of the lumber industry.

**Shirtings,** cotton fabrics, white or coloured, figured or plain.

**Shoddy,** fabrics made from old woollen rags and cuttings. The fibres of soft woollen rags are especially called shoddy. Mungo is the fibre obtained from hard and fine woollen rags and new cloth cuttings, and extract wool is abstracted from mixed fabrics. The threads are cleaned, oiled, and sometimes mixed with fresh wool, and the material is made into rugs, druggets, clothing, yarn, &c. There are numerous shoddy mills in Batley, Dewsbury, and Leeds, in the United States (particularly in Ohio, Pennsylvania, Massachusetts), and some of this material is manufactured in France and Germany

**Shoes.** *See* **Boots** and **Shoes.**

**Shola,** or Sola. The white pith of an Indian leguminous plant, *Æschynome aspera*, which is made into light and cool hats and sun helmets.

**Shooks,** sets of wooden staves and battens for making sugar-boxes, hogsheads, and casks.

**Shot.** All solid projectiles with which firearms are loaded are called shot. Those for cannon and machine-guns are made of cast iron or steel, and when more than 3 lbs. in weight contain a small cavity. Shot for small-arms are made of lead. Bullets are cast in moulds, and small shot for sporting purposes are formed by dropping molten lead, mixed with a little arsenic, through a colander into water, 100 to 250 feet below. The larger the shot the greater the height required. Misshapen shot, which will not roll down an inclined plane, are rejected, and the perfect globules are polished with a little plumbago.

**Shrimps.** The common shrimp, *Crangon vulgaris*, is abundant on the British seas and on the coasts of Northern Europe and America. Off the coast of California also large quantities are taken by Chinese. Prawns, which belong to the *Palæmon*, *Pandalus*, and other species, are larger and more esteemed by many connoisseurs.

**Shrub,** a liqueur made of rum flavoured with sugar and the juice of limes or lemons.

**Shude,** the husks of rice and other refuse from rice-mills sold to mix with oil-cake.

**Silk Cotton.** Silky fibres are obtained from several trees of the natural order of Malvaceæ. This fibre, which covers the seeds, is too short for spinning, but is used for stuffing pillows, mattresses, &c. *Bombax Malabaricum* yields *simal* fibre, and *Eriodendron anfractuosum* the East Indian *kapok*. *Bombax ceiba* of the West Indies and South America also yields fibre, and *Chorisia speciosa* what is known as vegetable silk. *See* also **Vegetable Hair.**

**Silk Grass.** *See* **Pita.**

**Silkworm Gut,** the drawn out spinning glands of the silkworm. When these are fully distended the worms are soaked in vinegar and then the glands are drawn out. They are prepared in China, Italy, and Spain for fishing-tackle.

**Silver.** *See* Plate 145.

**Silver Plate.** *See* **Plated Goods.**

**Simaruba.** *See* **Quassia.**

**Singhara Nuts,** the seeds of *Trapa bispinosa*, an aquatic plant. They form a large part of the food of the inhabitants of Kashmir.

**Sisal Hemp,** the fibre of *Agave Sisalana*, so named because it was first exported from the port of Sisal in Yucatan. It is especially valuable for ships' cables, as it resists the action of sea-water better than other material. About 399,000 tons are produced in Mexico (Yucatan, Campeche, and Chiapas), and the plant is cultivated in Central America and the Bahamas.

**Sissoo,** the wood of *Dalbergia Sissoo*, very strong and elastic. *See* **Rosewood.**

**Size,** fine light-coloured glue, used for sizing walls, &c., and for stiffening straw, cotton, and other plaited materials for hats.

**Skins.** *See* **Hides** and **Furs.**

**Skunk,** a small animal of the weasel tribe, more disagreeably odoriferous than any other of the family. The common skunk, *Mephitis mephitica*, is common throughout North America, and is particularly abundant in the Hudson Bay region. The fur of the skunk is much sought after, and is often passed off as Alaska sable.

**Slag.** The slag of blast-furnaces, of which enormous quantities are produced, consists almost entirely of silicate of lime and alumina. It is moulded into bricks and slabs for paving, and by the action of steam is made into fine threads called slagwood or silicate cotton, which is a bad conductor of heat and sound, and is therefore used to cover boilers and to prevent sound passing through floors.

**Slate,** a fine-grained argillaceous rock easily split into thin plates. It is made into roofing and school slates, dairy fittings, cisterns, chimney-pieces, &c. Slate is mined in large quantities in Wales, in the Ardennes, and in the United States, especially in Pennsylvania. Near Genoa good slabs are obtained. Slates are produced in the world to the value of about £3,600,000, of which Great Britain accounts for about £1,600,000, the United States £1,100,000, and France £700,000. The United

Kingdom exports roofing slates of home production to the value of about £130,000, more than 60 per cent. to Germany. Large quantities are also imported.

**Slops.** A common name for ready-made clothing.

**Snake-Root.** *See* **Senega Root** and **Serpentary Root.**

**Snake-Wood.** *See* **Letter-Wood.**

**Snapper.** A widely distributed fish in Australian waters, and an important market fish. It is *Pagrus unicola* of the Sea Bream family.

**Sneeze-Wood,** *Pteroxylon utile*, one of the largest and most valuable trees in Cape Colony. The wood is of a yellowish colour, and grained somewhat like satinwood. It is used for cabinet-making and engineering purposes.

**Snuff.** *See* **Tobacco** (Plate 161).

**Soap.** Soaps are compounds formed by the action of alkalies on fats and fatty acids, and are distinguished as hard (soda) soaps and soft (potash) soaps. For hard soaps tallow, palm-oil, coconut oil, olive oil, and seed oils are used, and for soft soaps linseed oil, castor oil, and fish oils. Hard soaps are most used, and are curd, mottled, or yellow. Toilet soaps are made of good curd or yellow soap, from which all free alkali is removed, and rendered perfectly homogeneous by repeated rollings. White Castile soap made at Marseilles from olive oil is used in dressing silk. Lead, arsenic, &c., are mixed with soaps for medical and industrial purposes. Great Britain, France, and Germany are the chief exporting countries.

**Soapberry.** The fruits of several trees contain a pulp which can be used as a substitute for soap. Those of *Sapindus Saponaria* in the West Indies and of *S. attenuatus* and *S. emarginatus* in the East Indies are thus used, and with the seeds of the last-mentioned species silk-stuffs are cleaned in France.

**Soapstone.** *See* **Steatite, Talc.**

**Soapwort,** the root of *Saponaria officinalis*, a plant which grows over all central and southern Europe and in Asia Minor, contains saponine, and is used for washing silk and wool. In Spain and North Africa the Egyptian or Levantine soapwort (*Gypsophila struthium*) is used.

**Soda.** Soda ash, or sodium carbonate, is manufactured in large quantities from common salt, which is first converted into sodium sulphate, or Glauber's salts. The ammonia-soda process is also commonly employed. Soda is used in soap and glass making, bleaching, &c. When crystallised it becomes washing soda. Bicarbonate of soda, a white powder, is chiefly used in medicine and in the production of effervescing drinks. Caustic soda, or sodium hydroxide, is employed in soap and paper-making and in the preparation of oxalic acid and certain coal-tar dyes. Large quantities of soda ash are manufactured in Great Britain, France, and Germany, and in dry regions carbonate of soda occurs native, especially in Oregon and California, and in Chile nitrate of soda is obtained. *See* **Nitrate.**

**Soda Oil,** oil forced into skins in the tanneries and then washed out with soda. It is again used in dressing leather.

**Soda Water.** *See* **Mineral Waters.**

**Sohaga.** Hindi name for tincal (*q.v.*).

**Solazzi.** Licorice juice in sticks, exported from Italy.

**Soles,** a delicate flat fish, *Solea vulgaris*, which is caught in largest numbers off the coasts of England, especially in the North Sea, and along the west coast of Europe. The lemon sole also is caught off the coasts of the British Isles, and the dab and lemon dab (*Pleuronectes limanda* and *P. microcephalus*), species of flounder. Small soles are called slips.

**Sorrel,** salts of binoxalate of potash, obtained from the wood-sorrel (*Oxalis acetosella*) and from several species of the true sorrel (*Rumex*). It is prepared chiefly in Germany and Switzerland, and is used in calico-printing, in dyeing wool and silk, in removing stains and bleaching straw. Salt of lemons is another name for it. *See* also **Oxalic Acid.**

**Souari Nuts,** the edible nuts of *Caryocar butyrosum* and *C. nuciferum*, trees of Guiana and Brazil. They yield a bland oil, and their wood is hard and useful for shipbuilding.

**Soursop.** *See* **Custard Apple.**

**Sowa.** Indian name for caraway seeds.

**Soy,** a thick piquant sauce made from the Soy bean (*Soja hispida*), a plant indigenous in China, Japan, and the Moluccas, and also cultivated in India. In China and Japan large quantities are grown (fully 20 million bushels annually in the latter country), and are an important article of food. The soy is made by mixing the beans with an equal quantity of wheat or barley, and allowing the mixture to ferment. It is the foundation of numerous sauces made in Europe and America.

**Spaniard's Beard,** or Beard Moss. The fibre of *Tillsandia usneoides*, a Bromeliaceæ, which grows in the warmer parts of America, especially Guiana. It is an excellent substitute for horse-hair in stuffing mattresses, &c.

**Spanish Fly.** *See* **Cantharides.**

**Spanish Stripes.** A woollen fabric of which a large number of pieces are imported into China.

**Spelt.** *See* **Wheat.**

**Spelter.** *See* **Zinc.**

**Spermaceti,** a waxy matter found mixed with oil in the head and in certain parts of the body of the cachalot or sperm whale. It enters into the composition of ointments, especially cold cream, pomades, and candles.

**Sperm Oil.** The most valuable oil of the sperm whale is found in a large cavity behind the cranium, mixed with spermaceti, and with it constituting the "head matter," but at the refineries the body oil is mixed with it. Sperm oil is the best lubricant for light rapidly running machinery. Much of the sperm oil of commerce is mixed with hydrocarbon and other oils. *See* also **Whales** and **Oils.**

**Spice.** *See* Plate 96.

**Spicewood,** or Benjamin tree. A shrub of North America, *Benzoin odoriferum*, of the order Lauraceæ. The bark and berries yield a stimulant and tonic medicine.

**Spiegeleisen,** iron containing a large proportion of carbon and manganese, used in the manufacture of Bessemer steel.

**Spikenard,** or Nard, a perfume derived from *Nardostachys Jatamansi*, a plant of northern India. The roots are now more frequently used as a medicine. Others of the Valerianaceæ are also aromatic, and considerable quantities of *Valeriana Celtica* are shipped from Trieste to the East, where a salve is made from them much used in bathing.

**Spirits.** Spirits are distilled from grape juice, malt, grains, fruit, beetroot, potatoes, and molasses. Many of those used as beverages are described separately, such as brandy, whisky, gin, rum, and liqueurs. A considerable quantity is also used for various industrial purposes. *See* **Methylated Spirits.** The production of pure alcohol throughout the world is probably 500 to 650 million gallons. The largest producer is Germany, which manufactures about 84 million gallons (pure alcohol) annually. Russia produces fully as much, while the United States and Austria-Hungary follow. The largest consumption per head of population is in Denmark, Russia, and France. *See* Plate 93.

**Sponges.** Sponges are gathered chiefly in the Mediterranean and off the Bahamas and Florida. The soft white Syrian sponges are the best, and some of the Greek sponges fetch a high price. The West Indian sponges are large and coarse. *See* Plates 107, 108.

**Sprat,** a small fish of the herring family, *Clupea sprattus*. Being cheap, they are largely consumed by the poorer classes. They are, however, delicate fish, and are often preserved in tins in France, Norway, and Russia, and are sold as sardines, Norwegian and Russian anchovies. In America they are often preserved in cotton-seed oil.

**Spruce Beer.** *See* **Beer.**

**Squills,** the bulb of *Urginea scilla* or *Maritima*, a plant which grows on the sandy shores of the Mediterranean. The plant is gathered chiefly in Malta, Calabria, and Spain. In Greece, spirit is extracted from it.

**Squirrel.** The common squirrel, *Sciurus vulgaris*, of which there are many varieties, is hunted for its skin, especially in Russia and Siberia, but the number of skins obtained has diminished. At Irbit, in 1906, 2,500,000 skins were sold. The American squirrel, *S. Virginianus*, yields a grey fur, and the skins of the chipmunk or ground-squirrel of North America (*Tamias striatus*) are shipped to China.

**Star Aniseed.** *See* **Aniseed.**

**Starch.** This substance is made from maize, potatoes, wheat, rice, sago, and other vegetable products, but chiefly from maize. In Germany, varieties of potato exceptionally rich in starch are grown for the manufacture. Besides its use in the laundry, starch is extensively employed in dressing textile fabrics, in paper manufacture, and in the preparation of dextrine or British gum. Corn-flour, arrowroot, tapioca, and East Indian arrowroot, obtained from the tubers of *Curcuma angustifolia*, are starches prepared for food.

**Staves,** lengths of wood for making the sides of casks, are exported chiefly from Austria-Hungary, the Baltic Sea, and the United States (Michigan, Ohio, and Texas especially). The best are made of oak. About 127,300 loads, valued at £589,000 (av. 1902–04), are imported into the United Kingdom.

**Steam Engines.** Great Britain and the United States are the chief exporters of steam engines. The annual exports of Great Britain are of the value of more than £5,000,000, of which more than two-fifths refers to locomotives. The United States exports to the value of nearly £1,390,000, locomotives being the chief kind. *See* also **Machinery.**

**Steam Vessels.** The largest fleets of mercantile steamers and their net tonnage are in round numbers as follows:—Great Britain, 10,400 vessels of 8,750,000 tons; Germany, 1620 of 1,740,000 tons; France, 1400 of 585,000 tons; and Norway, 1400 of 604,000 tons. The steam vessels of the United States have an aggregate tonnage of about 2,900,000.

**Stearine,** the chief constituent of the more solid fats, used in candle and soap-making. *See* also **Tallow.**

**Steatite.** *See* **Talc.**

**Steel.** *See* Plate 129.

**Steel Pens.** Birmingham is the principal seat of this manufacture. Germany has two factories (Leipzig and Berlin), France three at Boulogne, and the United States three, the steel being imported into the last country from England or Sweden. The manufacture of gold pens tipped with iridium has become a speciality in the United States, where they are made chiefly in the State of New York.

**Stinkwood,** a tree growing at the Cape of Good Hope, *Oreodaphne fœtida*, of the laurel family. The wood has an unpleasant odour, but is very durable, takes a good polish, and resembles walnut.

**Stockfish,** cod dried in the sun without salt.

**Stone.** The most important stones in commerce, such as granite, slate, grindstones, marble, bath stone, &c., will be found under separate headings. Several precious stones are entered under their individual names.

**Storax,** a gum derived from *Styrax officinalis* of Greece and the Levant, which resembles benzoin. *See* **Benzoin, Liquidambar,** and **Rose Malloes.**

**Stramonium.** The leaves and seeds of the thorn-apple contain an alkaloid, daturine, nearly identical in its action with atropine, and are employed in medicine, especially to relieve asthma. The common thorn-apple, *Datura stramonium*, is met with in Europe, Asia, the north of Africa, and North America. Other species, *D. metel* and *D. tatula* in India, and *D. sanguinea* in Peru, are used in the preparation of narcotic drinks.

**Straw.** Straw is used in paper-making, for matting, packing material, &c. One of its most important applications is for straw plait, which is made up into hats, small baskets, &c. Wheat, rye, and rice straws are used, but the former is the best. At Luton, Bedfordshire, the straw is split, while in Tuscany whole straws from a particular kind of wheat are plaited. Large quantities of straw plait are exported from China at a lower price than European plaiters of low class straws can produce them. London is the market for Chinese plait. *See* also **Hats.**

**Strontium,** a metal of a yellowish white colour, which occurs as a carbonate in the mineral strontianite, found near Strontian, Argyllshire, and in Germany, and, as Celestite (a sulphate), in Sicily. The hydroxide is used in sugar refining, but barium hydroxide is taking its place. The nitrate and chloride are used in fireworks.

**Strophanthus,** the seeds of *S. hispidus*, a plant of tropical Africa, are used in medicine as a heart stimulant. They are very poisonous.

**Strychnine.** *See* **Nux Vomica.**

**Sturgeon.** The common sturgeon (*Acipenser sturio*) ascends the rivers of Europe, and furnishes the caviare of the Elbe; the sterlet (*A. ruthenus*) is found in the Danube and Volga and in the Caspian Sea, and the species *A. huso* and *A. stellatus* are found in the Black and Caspian seas. The largest fisheries are those of the Volga and the other rivers of southern Russia. The flesh of the fish is salted, and caviare and isinglass are made from the roes and air-bladders. Species of sturgeon frequent the rivers and lakes of North America, and caviare is made.

**Succades.** Fruits and other articles preserved in sugar.

**Sugar.** *See* Plate 77.

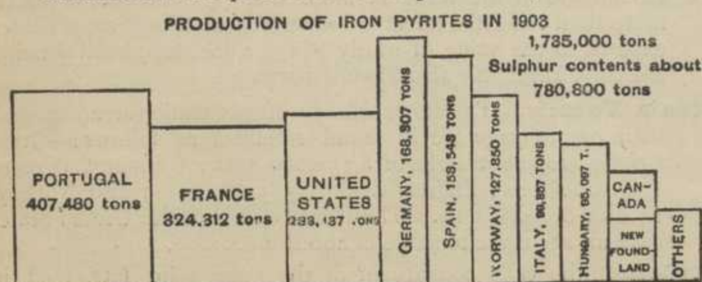
**Sugar of Lead.** *See* **Lead.**

**Suint.** The grease washed out of sheep's wool. As lanoline it is employed in pharmacy and soap-making.

**Sulphonal.** A synthetic hypnotic of very complex composition.

**Sulphur.** Native sulphur is widely distributed, especially in volcanic districts, and sulphur also occurs in combination with several other minerals. Italy produces about 850,000 tons, most of it native sulphur obtained in Sicily. In many other countries sulphur beds are worked (rich deposits have lately been discovered in Louisiana), but the larger part of the domestic supply is derived from iron pyrites, which are much used in the manufacture of sulphuric acid and in the wood-pulp industry. Sulphur is employed in large quantities for the manufacture of gunpowder, matches, &c., and in the form of sulphurous acid is a bleaching agent, but the greater part is consumed in the production of sulphuric acid, or oil of vitriol.

PRODUCTION OF IRON PYRITES IN 1903




Large quantities of this acid are used in soda manufacture, bleaching, dyeing, and calico-printing, and in many other industrial and chemical operations. The sulphates are also very important, for which *see* **Alum, Baryta, Copperas, Bluestone,** and **Plaster of Paris.**

**Sultanas.** *See* **Raisins.**

**Sumac,** or **Sumach,** the twigs and leaves of *Rhus cotinus* and *R. coriaria*, for tanning and dyeing black and yellow. *See* **Fustic.** The best comes from Sicily, and that of Spain is little inferior in quality, but is often adulterated. In southern France the leaves of *Coriaria myrtifolia*, the tanner's sumach, are similarly used. The *R. vernicifera* yields the fine Japanese varnish, and *R. succedanea* candle-wax. Average imports, 1903–05, 12,184 tons (£115,667), mostly from Italy.

**Sumbul,** the perfumed roots of *Ferula sumbul*. *See* **Musk Plants.**

**Sunflower Seed.** The annual sunflower (*Helianthus annuus*) is grown in Russia and Hungary for the sake of its seeds, which yield an edible and illuminating oil. Of the vegetable oils extracted in Russia, the sunflower supplies about 20 per cent. The seedcake is exported to Germany and Great Britain.

**Sunn Hemp,** the fibre of *Crotolaria juncea*, a leguminous plant which grows in India and other parts of southern Asia. Jabalpur hemp is the fibre of *C. tenuifolia*. This material is made into ropes and other coarse goods.

**Supplejacks,** flexible stems of *Serjania triternata*, and various Paullinias of America, which are made into walking-sticks. Australia and New Zealand also export supplejacks.

**Swan.** The skin and feathers of wild swans are sold, the down being used as trimming, &c., and for powder puffs. A few quills are made into pens. *See* **Down** and **Quills.**

**Sweet Flag.** *See* **Calamus.**

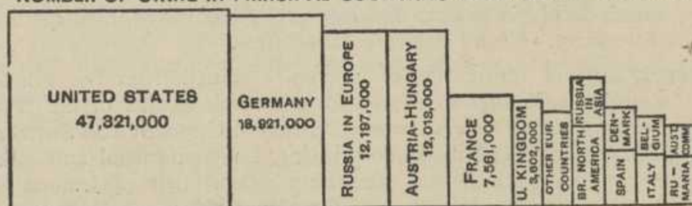
**Sweet Potato.** The true sweet potato, *Batatas edulis*, of the order Convolvulaceæ, is planted in southern Asia, tropical America, and the United States. The roots weigh on an average 3 lbs. to 12 lbs. *B. Jalapa* is grown in Mexico, and *B. paniculata* in Western Africa.

**Sweet Sop.** *See* **Custard Apple.**

**Sweets.** A trade-name for aromatic liqueurs and cordials and home-made wines.

**Swine.** The common swine, *Sus scrofa*, is a native of most countries of Europe and Asia, and has been introduced into America. The Chinese breed, noted for its fertility and the rapidity with which it lays on flesh, and the black Neapolitan, also easy to fatten, have been crossed with British breeds. The most noted of these are the Yorkshire, Berkshire, Suffolk, and Cheshire. The pigs of America are the Chester White, the Poland-China, and the Berkshire. About 118 million pigs are kept in Europe, North America, Australasia, and Argentina, of which nearly half are in the United States. They are numerous also in Austria-Hungary, Russia, and Germany. Pigs yield bacon, hams, lard, bristles, sausages, and sausage skins, &c., all which articles are noticed separately. The United States exports large quantities of all these products, Chicago being the chief centre of the curing industry, besides living animals. Among European countries Russia exports a considerable number of live pigs, and Denmark has a comparatively large trade in hog products.

NUMBER OF SWINE IN PRINCIPAL COUNTRIES FROM LATEST RETURNS




**Tacamahaca,** resin obtained from *Calophyllum inophyllum*, which grows in the East Indies. *C. tacamahaca* of Madagascar and Bourbon; *Bursera gummifera*, growing in the French West Indies and Porto Rico, also yields a similar resin. The name is also applied to the resins of *Icica tacamahaca* of Brazil, and in general is used rather loosely.

**Tacks,** small broad-headed nails. They are made up in packets of 1000, and a three oz. packet contains tacks $\frac{3}{8}$ in. long; a four oz. packet contains tacks $\frac{7}{16}$ in. long, &c., while the largest are $1\frac{1}{4}$ in. long in twenty-four oz. packets.

**Taffeta,** a name now applied to all kinds of plain silk and even to some combinations of silk and wool, &c.

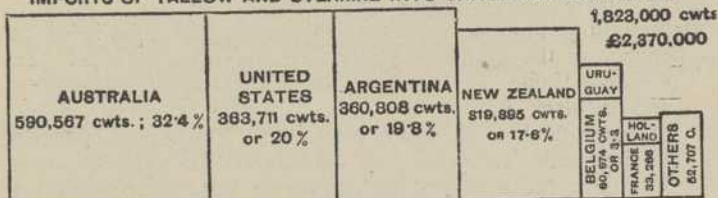
**Taggers,** thin iron plates, sometimes tinned.

**Talc,** magnesium silicate, found chiefly in Tyrol, Styria, and Switzerland, and in North America. It occurs in lamina or in a fibrous form, and is used as a polishing material, and in the manufacture of rouge. Steatite or soapstone is a massive variety known as French chalk or Briançon chalk. It is used for removing spots from cloth, and other purposes to which fibrous talc is applied, and also by tailors and glaziers, being sometimes made into

pencils. Enstatite, another form, is fibrous, and is mixed with wood pulp in the manufacture of paper.

**Tallow,** the melted fat of animals, chiefly cattle and sheep. From the United States the export is very large, but has lately fallen to about 35 million pounds. Australia, Argentina, and Russia also export large amounts. Tallow is used in the manufacture of candles and soap, in dressing leather, and as a lubricant. Tallow oil, the oleine which remains after the stearine has been removed, is used as a lubricant, and in the manufacture of margarine. Of the quantity shown in the diagram the tallow amounted to about 800,000 cwts., the greater part coming from Australia and New Zealand. About 644,000 cwts. were re-exported, besides 113,560 cwts. of home tallow.

IMPORTS OF TALLOW AND STEARINE INTO UNITED KINGDOM IN 1905




**Tallow Tree.** This name is given to several trees which have a tallow-like substance enveloping their seeds, such as the *Vateria Indica* or East Indian copal, and *Stillingia sebifera* from which candles are made in China, and which has been introduced into the West Indies. The name is also given in North America to a candleberry.

**Tamarind,** the pods of *Tamarindus Indicus*, a leguminous tree now cultivated in almost all warm climates, contain a pleasant acidulous pulp, which is a refrigerant and gentle laxative. The fruit is removed from the pod and kneaded into a paste. The best tamarinds are exported from the West Indies preserved in syrup. The inferior kinds, from Egypt and the East, are used in sauces. A similar pulp is produced by the tamarind plum of India (*Dialium Indicum*), and by species of Codarium in Sierra Leone. The wood of the tamarind is very beautiful, but extremely hard.

**Tampico Fibre,** a fibre obtained from the leaves of the yucca (*q.v.*), and named after the port Tampico in Mexico.

**Tanekaha Bark,** the bark of *Phylloc'udus trichomanoides*, a New Zealand conifer, used for tanning and dyeing glove leather.

**Tanning Extracts.** Extracts from tanning barks are manufactured in several countries and exported and sold in place of the more cumbrous bark, such as extracts from the wattle-barks of Australia, quercitron, Campeachy wood, &c. *See* also **Bark.**

**Tapa.** Cloth made in the Pacific Islands from the fibre of *Broussonetia papyrifera*. *See* **Mulberry.**

**Tapioca,** a farinaceous substance obtained from the root of the cassava or manioc (*Manihot utilissima*). It is made from Brazilian arrowroot by heating the arrowroot on hot plates, when some of the starch grains burst and are converted into dextrine. *See* also **Cassava.**

**Tar.** Tar is the insoluble residue from the distillation of wood, coal, or shale. Wood-tar, produced in Europe chiefly from the Scotch fir, contains wood-spirit, creasote, and naphtha, &c., as well as heavy oils. Coal-tar contains a large proportion of benzol and colouring matter, and yields aniline dyes, alizarine, and medicinal substances. It is produced chiefly in the manufacture of gas.

**Tares,** *Ervum sativum*, a leguminous plant nearly allied to the vetches, which is cultivated in some parts of Europe as cattle fodder. Vetches and tares are included under lentils (a species of tare) in trade returns.

**Tarpaulin,** a strong linen or hempen cloth rendered waterproof by a coating of stearine or bone-tar pitch.

**Tarragon.** *See* **Wormwood.**

**Tartar, Cream of,** refined bitartrate of potash, taken medicinally and used as a baking powder. *See* **Argol.**

**Tartar Emetic.** *See* **Antimony.**

**Tartaric Acid,** obtained from argol or tartar. It is used in dyeing and calico-printing, and in the manufacture of aerated waters.

**T. Cloths,** stout unbleached cotton cloths, largely exported to China.

**Tea.** *See* Plates 81–84.

**Teak,** a tree (*Tectona grandis*) of the order Verbenaceæ, which grows in India, Burma, and Siam, Java, and other islands of the Malay Archipelago. The wood is fairly hard, and is used in shipbuilding, and the armour-plates of ships-of-war are backed with it, as it contains some ingredient which prevents iron in contact with it from rusting. The bark is used in tanning, and the leaves yield a purple-red dye. African teak (*Oldfeldia Africana*) is also a good timber, though not equal to the East Indian.

**Teasel,** *Dipsacus fullonum*, a half shrubby plant, is cultivated in many European countries, and in Somerset and Yorkshire. The thorny heads, cut off when the plant is in flower, are used to raise the nap on cloth, no mechanical contrivance hitherto invented answering the purpose so well.

**Teneriffe,** a dry wine exported from the island of Teneriffe.

**Tent,** a rich wine of Cadiz, Spain.

**Terebene.** *See* **Turpentine.**

**Terebenthine.** French oil of turpentine distilled from *Pinus maritima* and other conifers.

**Terne Plates.** *See* **Tin Plates.**

**Terra-cotta,** baked clay, buff, yellow or red; used in buildings, and moulded into various decorations.

**Terra Japonica.** A name still given in commerce to Cutch and Gambir.

**Terrapin.** *See* **Turtles.**

**Thorianite** and **Thorite.** Two minerals lately discovered in Ceylon, containing a large proportion of thoria, which is used in the manufacture of gas mantles.

**Thorn-apple.** *See* **Stramonium.**

**Thus.** Turpentine gum as picked from the tree.

**Thymol.** The common thyme (*Thymus vulgaris*) and the wild thyme (*T. serpyllum*) both yield an oil from which thymol, an antiseptic phenol, is obtained by distillation. Large quantities of thymol are manufactured from ajowan seeds (*q.v.*).

**Tiger-wood,** the beautifully grained heart-wood of *Machærium Schomburgkii*, a tree of British Guiana.

**Til.** *See* **Sesame.**

**Tile-fish,** a deep-sea tropical fish (*Lopholatilis chamæleonticeps*), which frequently appears off the Atlantic coast of the United States and may become an important table fish.

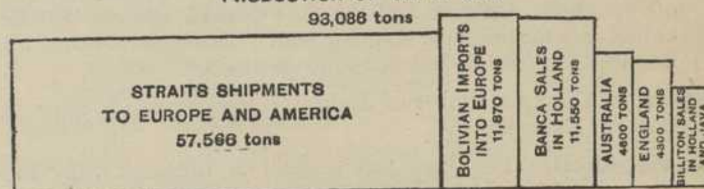
**Tiles.** Besides the ordinary clay tiles for roofing, decorative tiles are made for walls, hearths, &c. Encaustic tiles in which the pattern is made with clay powder and pressed into the body of the tile are made in the Staffordshire potteries.

**Timber.** *See* Plate 158.

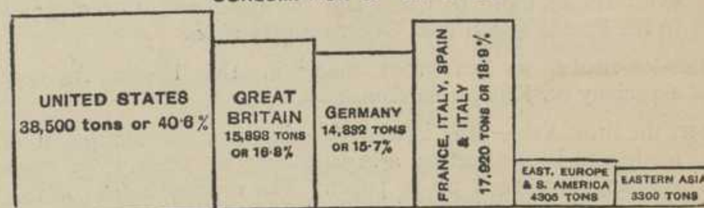
**Timothy Seed,** the seed of the forage grass *Phleum pratense*, which is very extensively cultivated in the United States. About 15 million pounds are exported in the year.

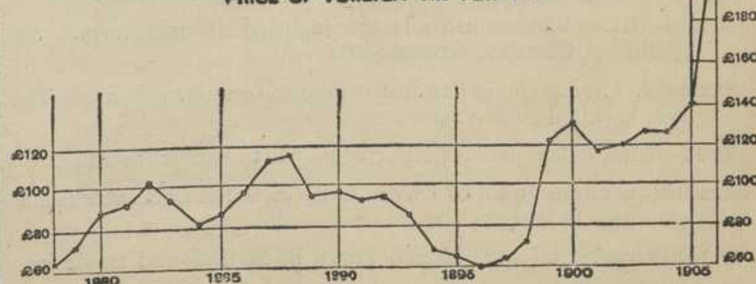
**Tin.** This white metal is somewhat rare. It seldom, if ever, occurs native, but is generally found in the form of cassiterite or binoxide. Tin now comes chiefly from the East, the Malay Peninsula, Banca, and Billiton in the Dutch East Indies. Australia and Tasmania and Cornwall yield ore, and a little is mined in Saxony, Bohemia, and the United States, and a certain quantity in Durango, Mexico. The production of China is said to be large, but it is consumed entirely at home. In the last ten years the output of tin has increased by fully 25 per cent., but the consumption has increased still more, and the stocks have fallen very low. From the middle of 1905 the price rose almost continuously till it reached £215 per ton in May 1906, and then fell to about £165 in June, and has since risen again. The high price has led to the re-opening of some Cornish mines, and the Transvaal may yield large

PRODUCTION OF TIN IN 1904




CONSUMPTION OF TIN IN 1904



quantities. In the meantime, however, very high prices are expected. Wood tin or fibrous tin occurs in small masses in the rock, and stream tin is the name given to it when found in alluvial deposits. Tin is chiefly used in alloys (*q.v.*) and amalgams, and in coating other metals. *See* **Tin Plate.**

**Tincal.** Crude borax exported from India.

**Tinfoil,** tin beaten out into very thin sheets, which are used for lining tea-chests and wrapping up confectionery, tobacco, &c. The process of manufacturing mirrors with tinfoil and mercury is little practised now.

**Tin Plates.** Sheet of iron or steel covered by dipping them in molten tin. The plates before dipping are called black plates. Sometimes instead of tin an alloy of tin and lead is used, and the plates are known as terne plates (Fr. *terne* = dull). These are used in America for roofing, and are often called roofing-plates. South Wales is a great centre of the manufacture, and used to supply most of the tin-plate of the world. Great Britain exports about 320 thousand tons of tinned plates, and fully 60 thousand of black plates. The United States (Pennsylvania, Ohio, Illinois, and New York) manufactured about 480 thousand tons in 1903, and imported 47 thousand tons. Considerable quantities are manufactured in Westphalia and Rhenish Prussia; few in France. *See* **Tinware.**

**Tin Salt.** Stannous chloride, manufactured for dyers and calico-printers, who use it as a mordant.

**Tinware.** Vessels for domestic use are manufactured from tin-plate. About 6 per cent. of the plates is waste, which is bought up by dealers who recover the tin by the application of dilute sulphuric acid.

**Tobacco.** *See* Plate 161.

**Tokay.** A wine grown on the southern slopes of the Hegyalja mountains near the town of Tokay on the Theiss in Hungary. There are many kinds, of which the finest is the "Essence" pressed out of the grapes by their own weight. The total production is about 2,240,000 gallons, and genuine Tokay, especially the sweet or Imperial Tokay, can be obtained only in small quantities. It is often mixed with inferior wines, and many imitations are manufactured.

**Tolu,** the balsam of *Myroxylon toluifera*, used by perfumers and confectioners. It is named after the town Tolu in Colombia. *See* **Balsams.**

**Tomato,** or Love-apple (*Lycopersicum esculentum*), a plant of the order Solanaceæ, a native of South America, and now cultivated in all temperate countries. In northern Europe it does not ripen readily except under glass, and large quantities of the fruit are exported from more southern countries, both fresh and as sauce. The tomatoes of Naples and Rome are well known, and Guernsey exports tomatoes grown under glass to England.

**Tombac,** a brass, containing at least 80 per cent. of copper. Pinchbeck, an imitation of gold, is a form of tombac. Tombac or Tumbeki is also a tobacco prepared in Turkey.

**Tongues.** Ox tongues are dried and tinned in large quantities in South America, and to a smaller extent in France and other European countries. Sheeps' and pigs' tongues are also sold, and a few reindeer tongues are shipped from Russia.

**Tonka Beans,** the seeds of *Dipteryx odorata*, a leguminous tree of Venezuela, Guiana, and Brazil. Ciudad Bolivar, on the Orinoco, is the principal shipping port. The seeds are used for flavouring and in perfumes, and to scent snuff.

**Tooart,** or Tuart, the timber of *Eucalyptus gomphocephala*, a tree of Western Australia.

**Tortoise-shell.** The best tortoise-shell is obtained from the carapace of a sea-turtle, *Caretta imbricata*. In the East the best qualities are those of Manilla and Macassar, and in the West Indies those of Cuba and the Bahamas. Other places in the Pacific and Indian Oceans supply shell.

**Tous-les-mois,** an arrowroot made in the Lesser Antilles, especially St. Kitts, from *Canna edulis*.

**Tow,** the short waste fibre left after carding flax and hemp. It is made into bags, sheeting, and yarn, and the refuse from rope-spinning is worked up in paper. The coarser kinds of tow are known as codilla.

**Tragacanth,** the gum of various species of *Astralagus*. The best white tragacanth is shipped from Smyrna. *See* **Gums.**

**Train Oil.** Various fish oils are included in this term. *See* **Whales, Sharks, Sperm-Oils.**

**Treacle.** Syrup eliminated in the process of sugar refining. The best is called golden syrup.

**Tree-nails,** oaken pins for securing planks to timbers in ships.

**Trefoil,** a name given to clover seeds exported from continental countries in barrels.

**Trichinopoly,** a harsh tobacco grown in Madras, and made into long cigars.

**Trout.** The common trout, *Salmo fario*, is abundant in all the lakes and rivers of northern Europe. The great lake-trout, *Salmo ferox*, is found in some of the larger lakes in the British Isles and Scandinavia, and the *Salmo Lemannus*, perhaps only a variety, in the Lake of Geneva. Large numbers of the salmon-trout or sea-trout (*S. trutta*) are taken in British waters. *Salmo Levenensis* is a species peculiar to Loch Leven in Scotland, but now introduced into America. The common trout and sea-trout have been introduced into Australia. The chief American species are the lake trouts, *Cristivomer namaycush* and *S. confinis*, and the Oregon trout (*S. Oregonensis*) of the north-western States. Closely allied is the charr, *S. salvelinus*, found in the lakes of Scotland, Cumberland, and Westmorland, in those of Switzerland, and as far north as Spitzbergen. Of American charr, *S. fontinalis* has been introduced into Britain.

**Truffles,** fungi which grow at a depth of a foot or more below the surface of the ground, usually near the roots of trees. The common truffle is found in Wiltshire, Hampshire, and Kent, and is black in colour. More esteemed is the *T. melanospermum*, the best of the French truffles. Truffles are cultivated in the south of France, and are known as Périgord truffles. The chief centre is the department of Vaucluse, and markets are held at Apt from November to March. The total production of France is estimated at about 11 million pounds. In Germany the black truffle is rare, but the white truffle, an inferior kind (*Choiromyces albus*), is not uncommon in Austria, Hungary, Bohemia, Italy, and Russia. The truffle is a well-known condiment for patés de foie gras, soups, and entrées.

**Trumpeter,** an important market fish (*Latris Hecateia*) of Tasmania and New Zealand, which is sent in a fresh state, or smoked, to Sydney and Melbourne.

**Tuberose.** The common tuberose (*Polianthus tuberosa*) is largely cultivated in the south of France, and an essential oil is extracted from it which is much used in perfumery.

**Tule,** an American name for the bulrush.

**Tulips.** Holland is still the country where tulips are most cultivated, and large quantities of bulbs are exported annually.

**Tulip-wood** (*Liriodendron tulipifera*), a tree of the Magnoliaceæ order, which grows all over the United States, and has a yellow heartwood. The bark contains a bitter principle used as a substitute for quinine. The tulip-wood of Australia is obtained from *Harpullia Hillii*, *H. pendula*, and other species; that of India from *Thespesia populnea*.

**Tulle,** a fabric of thin silk network used as trimming, and for caps and veils. Originally made at Tulle, capital of the department of Corrèze, in France, the fabric is now manufactured at Saint-Pierre and Lyons. Nottingham is the English centre of the manufacture.

**Tungsten,** a rare metal chiefly derived from wolfram, a tungstate of iron and magnesia, but also from scheelite, a tungstate of lime. Tungsten ores are found in many places in Europe, in America (Colorado and Connecticut), and in South America. The output is small, for though the mineral is known to have some effect in the manufacture of steel, this effect has not been thoroughly investigated. Tungstate of soda prevents muslins and other light fabrics from bursting into flame when in contact with fire.

**Tunny.** The tunny is a fish belonging to the mackerel family. The common tunny (*Thynnus vulgaris*) is a large fish, very common in the Mediterranean and Black Seas, and less abundant on the Atlantic shores of Europe and America. It is salted and preserved in oil. The long-finned tunny (*Orcynus germo*), a much smaller fish, is caught chiefly in the Bay of Biscay. Tunny oil is used in dressing leather.

**Turmeric,** the rhizome of *Curcuma longa*, a plant of the ginger family, which grows in the East Indies, China, and Fiji. It has long been used in the East as a dye, but the colour is not permanent, and as a medicine. Turmeric is also a spice, is an ingredient of curry-powder, and is mixed with mustard. The imports into Europe have much diminished.

**Turnips.** The white turnip, *Brassica rapa*, and the variety known as Swedes, are largely cultivated in northern countries as food for cattle. In the British Isles the crop is about 27 million tons, but varies considerably. Belgium grows some 3,500,000 tons, and France, Germany, Denmark, and Sweden also grow turnips, but less extensively than Britain.

**Turnsole,** a blue colouring matter obtained from lichens. *See* **Litmus.** Also a red colouring matter made at Nîmes from a euphorbiaceous plant, *Crozophora tinctoria*, which is used to colour confectionery, and in Holland, cheeses.

**Turpentine,** a resinous substance secreted by various coniferous trees. German and French (the best) turpentine is chiefly from the *Pinus maritima*, Strasbourg turpentine from the silver fir (*Abies pectinata*), and Venice turpentine from the larch. In the United States, the chief exporting country, it is obtained from *A. Fraseri*, *A. Canadensis*, but chiefly from the long-leaf pine, *P. palustris*. In 1905 the exports of pitch, turpentine, &c., from the United States were of the value of £3,310,000.

Chian or Cyprus turpentine is derived from the terebinth (*Pistacia terebinthus*) which grows in the eastern Mediterranean. From turpentine, which is a mixture of resin and oil, oil of turpentine is obtained by distillation. It is used in mixing varnishes and oil paints, and as an irritant in medicine. Mixed with sulphuric acid and re-distilled it becomes terebene, a fragrant liquid employed as a disinfectant and as a cough medicine. In 1905 the United Kingdom imported 526,679 tons (£1,104,300) of turpentine oil, four-fifths coming from the United States.

**Turpeth Mineral,** the yellow basic sulphate of mercury.

**Turpeth Root,** the root of *Ipomœa purga* of the East Indies, Australia, and Polynesia, which yields a kind of jalap.

**Turquoise,** a blue stone consisting principally of phosphate of alumina. The finest stones are found near Nishapur and Mashad in Persia. Inferior stones are found in Germany, and in New Mexico, and Alabama in the United States. Fossil turquoise, or odontolite, is fossil ivory—tusks of the mammoth and elephant—coloured blue by phosphate of iron. It is found in Siberia and Languedoc.

**Turtles.** Several turtles are esteemed as food. The most valuable is the green turtle (*Chelone viridis*), found along the coast of America from Brazil to Cape Hatteras. Turtles are sent to the European market from the West Indies, particularly Jamaica. The flesh is also exported, dried or in tins. The terrapins (*Emydidæ*) are also eaten, the finest flavoured being the diamond-back (*Malacoclemmus palustris*). Many turtles and their eggs yield oil, and some kinds tortoise-shell (*q.v.*).

**Tussore Silk,** the wild or jungle silk of India, properly spelled tasar. *See* **Silk.**

**Tweeds,** woollen materials for clothing, rather loosely spun and felted. They derive their name from having been made originally at Galashiels and other towns on the Tweed, where are still the most important factories.

**Twills,** cloths with diagonal ribs produced by raising one thread of the warp and depressing two or more for the passage of the weft.

**Twist.** *See* **Yarn.**

**Type-metal,** an alloy of lead and antimony from which printing types are cast.

**Ultramarine,** a blue colour originally made from lapis lazuli, but owing to the high price of the stone, now made artificially. This French ultramarine is a composition of clay, sulphate of soda, carbonate of soda, and sulphur, and is made chiefly in Germany, though some of good quality is made at Fleurien-sur-Saône in France. Ultramarine is used as a water and oil colour, and to print paper and textiles.

**Umber.** *See* **Ochre.**

**Umbrellas.** The manufacture of umbrellas and parasols has increased to a great extent in Great Britain, but the value of the exports, about £430,000, is not as large as fifteen or twenty years ago. The value of the French exports is about £67,000. Silk, alpaca, cotton, and mixed materials are used in the manufacture.

**Unions,** fabrics of mixed materials—flax and cotton or wool and cotton.

**Uranium,** a rare element obtained usually from a pitch-blende which contains the black oxide of uranium. It occurs in the cobalt and silver mines of Saxony and Bohemia, and uranium phosphate in the granites of Autun and Limoges. Uranium and Vanadium are mined in Colorado, U.S.A., where about 3800 tons of ore were obtained in 1902. The price of uranium is about £16 per lb. It is used in glass and porcelain manufacture, and in iron and other alloys. Salts of these rare elements are manufactured to the value of about £50,000 annually.

**Urethane,** a chemical product made by the action of ammonia on ethyl carbonate. It takes the form of tasteless and colourless lamina, and is administered as a hypnotic.

**Vacoua.** Sacks are made in Mauritius and Réunion from the fibre of the screw-pine, *Pandanus vacoa*, in which sugar and coffee are packed. Matting is also made from the same fibre.

**Valencias,** raisins, prepared in Turkey by dipping bunches of grapes in hot lye, and drying them in the sun.

**Valerian,** the roots of *Valeriana officinalis*, a plant growing in Northern Europe and Northern Asia, and cultivated in the United States. They yield medicines valuable as stimulants, especially in nervous disorders. Other species possess the same property. The name is also given to the roots of the orchids *Cypripedium pubescens* and *C. parviflorum*, frequently used as substitutes. *See* also **Spikenard.**

**Valonia,** the large acorn-cups of *Quercus ægilops*, an oak indigenous in the Levant. In the neighbourhood of Smyrna 54,000 tons are gathered in the year. As a tanning material it ranks second only to oak bark. The average imports into the United Kingdom in 1903–5 were 26,254 tons (£277,110).

**Vanadium,** a rare mineral, like uranium (*q.v.*), used for the manufacture of alloys.

**Vanilla.** The vanillas are a genus of orchids which grow in tropical countries in both the Old and New Worlds. The best vanilla of commerce is obtained from *V. planifolia*, originally a native of the West Indies, but the *V. aromatica* of Guadeloupe and Brazil and other species yield vanilla. The best is grown in Mexico; and besides the countries mentioned in the diagram, Mauritius, Madagascar, Java, Fiji, &c., export small quantities. The pods of *V. aromatica*, thicker but shorter than the ordinary kinds, are called vanillons. The pods, usually 7 to 9 inches long, are dried and steeped in oil, generally that of the cashew nut.

AVERAGE EXPORTS OF VANILLA FROM CHIEF PRODUCING COUNTRIES



**Varnish.** Varnishes consist of resinous material mixed with linseed or some other drying oil, and are then called oil varnishes, or with volatile solvents, such as alcohol, benzol, &c., constituting spirit varnishes. Shellac, benzoin, elemi, mastic and sandarac are made up into spirit varnishes such as French polish. Copal, and amber, and other hard resins are the chief ingredients of oil varnishes. The finest and lightest mastic varnish is applied to oil paintings. *See* also **Lacquer.**

**Vegetable Hair,** the leaf fibre (*crin végétal*) of the Mediterranean palmetto (*Chamærops humilis*). It is made into ropes, sailcloth, and carpets; and in Algeria, into paper and pasteboard. Algeria is the chief source of supply, and Madagascar also exports this fibre. Other trees in America yield a similar material.

**Vegetable Ivory,** the nuts of a plant allied to the palms, *Phytelephas macrocarpa*, which are exported chiefly from Colombia and Ecuador, and are known as Corozo nuts and *Tagua*. Buttons, umbrella handles, and other small articles are made of them. In the years 1902–4 the imports averaged 16,696 cwts. (£9200).

**Vellum.** *See* **Parchment.**

**Velvet,** a silken fabric in which the warp threads are drawn up into loops. When the loops are cut the material is called cut velvet, and when they are left intact, pile velvet. Sometimes velvet consists of a silk face on a cotton basis. Mixtures of silk and cotton and cotton alone, similarly woven, are called velveteen and fustian (*q.v.*). Lyons and Crefeld are the chief centres of the velvet industry.

**Veneers,** thin sections of fancy woods for overlaying furniture. Also called scaleboards.

**Venetian Red.** A burnt ochre. *See* **Ochre.** This colour is now, however, made artificially.

**Verbena, Oil of.** A name for lemon-grass oil. *See* **Grass Oils.**

**Verdigris,** acetate of copper, used as a green pigment, and in the preparation of other green colours. It is manufactured largely in the south of France by the action of acetic acid on sheets of copper. The verdigris of Montpellier and the verdigris of Grenoble are somewhat different in character.

**Verditer,** hydrated oxide of copper, made by adding lime to a solution of a salt of copper. It is of a blue colour, and is used in pigments and paper-staining. Green verditer, made by boiling the blue pigment, is of little value.

**Vermicelli.** *See* **Macaroni.**

**Vermilion,** a beautiful red pigment, obtained by grinding pure pieces of cinnabar, sulphide of mercury. It is, however, generally made artificially by combining mercury and sulphur. The best is Chinese vermilion, which may be natural.

**Vermouth,** a bitter made of white wine, absinthe, gentian, and other roots. It is made in France, but the vermouth of Turin has the highest reputation.

**Vetches.** Various species of vetch (*Vicia*) are cultivated, like tares, for cattle fodder.

**Vetives,** the dried roots of kuskus grass (*q.v.*).

**Vevey,** a kind of cigar or cheroot, made at Vevey and other towns on the lake of Geneva.

**Vicuña.** The vicuña is an American wild animal of the same genus as the llama and alpaca, and closely allied to the camel. It frequents the more desolate parts of the Cordillera of the Andes, and yields a more valuable wool than the alpaca (*q.v.*).

**Vinegar.** Vinegar is diluted acetic acid, and good vinegar is made from the fermentation of malt, and in wine countries from poor sour wine. Fruit, beetroot, &c., can be used for the purpose, and sometimes alcohol is the material. When the foreign matter is removed by distillation, the liquid is called distilled vinegar, but what is generally sold under this name is an acetic acid distilled from wood (pyroligneous acid). It is quite wholesome, but has not the agreeable flavour of other

vinegars. In industries, vinegar or acetic acid is used in the manufacture of sugar of lead, albumen, verdigris, &c. For culinary purposes it is flavoured with tarragon, shalots, chillies, &c., and toilette vinegars are made by the addition of essences of flowers, barks, and other perfumes.

**Vinhatice,** a Brazilian wood obtained from *Echyrospermum Balthazarii.*

**Violet Wood,** a name for Kingwood (*q.v.*).

**Vitriol.** For green vitriol, *see* **Copperas;** for blue vitriol, *see* **Bluestone;** and for white vitriol, *see* **Zinc.** Oil of vitriol, or vitriol simply, is sulphuric acid.

**Vulcanite,** or vulcanised india-rubber. Vulcanite, or ebonite, is india-rubber mixed with about a third of its weight of sulphur, and heated, when it becomes hard and horny. If only a small proportion of sulphur be added and the mixture is subjected to a lower temperature, soft vulcanised india-rubber is produced. French chalk, litharge, asphalt, and a number of other substances are generally added. Beltings, fire-hose, washers, and many other articles are made of soft vulcanised india-rubber, and combs, paper-knives, buttons, and other small articles of vulcanite.

**Vulture Feathers.** *See* **Ostrich Feathers.**

**Wainscot Oak.** Logs of the Turkey oak (*Quercus cerris*) are exported from Russia for furniture and for panelling rooms.

**Walking-Sticks.** Almost all kinds of European woods are used in the manufacture of walking-sticks. Malacca canes and Penang lawyers are exported from the East Indies; pimento canes and supplejacks from the West Indies.

**Wallabies,** small species of kangaroo, the skins of which are exported from Australia as furs and for leather. *See* **Kangaroos.**

**Walnut.** The common walnut (*Juglans regia*), a native of Persia, grows all over the south of Europe, and in small numbers as far north as 56°. The wood is valued as a cabinet-wood, the roots and husks supply a wood-stain, and the nuts are eaten fresh and pickled, and yield a valuable drying oil. The timber of the black walnut (*J. nigra*) of the United States is still more valuable, but the fruit is inferior. The butternut of North America (*J. cinerea*) yields a useful wood, not apt to split or warp, and good-flavoured nuts.

**Walrus,** or Morse. There are two species of walrus, *Trichechus rosmarus*, in the Arctic seas, and *T. obesus*, in the North Pacific. Both are hunted for their skins, oil, and tusks. Nothing is equal to walrus leather for polishing bright metal surfaces, and this leather is now sometimes used in cotton ginning. Many fancy articles are also made of it, but seal leather is often substituted. The oil is more fluid than seal oil, with which it is often mixed. The tusks are remarkable for their hardness and whiteness, and are turned and carved into various trinkets.

**Washing Blue.** *See* **Prussian Blue.**

**Wash Leather,** a popular name for chamois leather (*q.v.*).

**Watches.** Watches and clocks are manufactured in England, France, Germany, Austria, Switzerland, and America. Switzerland manufactures as many watches as the other countries together, and exports to the value of more than 4¼ million pounds sterling. In the United States watch-making has advanced rapidly through the development of machinery for the manufacture, but the export is small. The chief centres in England are London, Coventry, Birmingham, Liverpool, and Prescot.

**Wattle Bark.** Several Australian acacias yield bark useful in tanning, especially the Black Wattle (*A. decurrens*), from which a kino is also obtained. The bark is often sold as mimosa bark.

**Wax.** *See* **Beeswax, Candleberry, Japan Wax, Carnauba Wax.**

**Whales.** The most valuable of all whales are the Greenland or "right" whale (*Balæna mysticetus*), and the southern right whale (*B. Australis*). In the former the plates of whalebone or baleen, which hang down from the upper jaw, have a length of about 9 feet, and in some animals considerably more. The southern right whale yields shorter plates, and other species, as the humpback (*Megaptera boops*) and the rorquals (*Balænoptera*), baleen of little value. These, as well as the toothed whales—the bottle-nose, pilot, and white whales, &c.—yield oil, which, with the exception of sperm oil (*q.v.*), are usually mixed together. The Greenland whale or Bowhead yields on an average about a hundred barrels of 26¼ gals. each, the humpback about 40, and the beluga only 1½. The total whale-oil production of the world is about 2½ million gals., some 625,000 gals. being obtained by the fishing-fleet of the United States, and 750,000 by that of Norway.

**Whangee,** a cane for walking-sticks, obtained in China from *Phyllostachys nigra* and other species of bamboo.

**Wheat.** *See* Plate 61.

**Whisks, Venetian.** Panicles of broom-corn.

**Whisky,** a spirit usually made of barley, barley-malt, or a mixture of the two, though potatoes or any other starchy substance will answer the purpose. Pure malt whisky is made chiefly in Scotland. About a third of malt is generally used with two-thirds of barley, oats, rye, or maize. Much of the English production is patent-still, or "silent," spirit, which is chiefly pure alcohol extracted from any starchy substance, and lacks flavour. The Bourbon whisky of the United States is made of wheat or maize, and was originally distilled in Bourbon county, Kentucky, and rye also is used in the United States. On the continent of Europe large quantities of potato spirit are converted into various liquors.

**Whitebait,** the fry of the herring and sprat, caught chiefly in the Thames, but occasionally in other British rivers and on the continent.

**White Lead.** *See* **Lead.**

**White Pigments.** White lead is the most important, and in a pure form is known as Flake white. Zinc white, or oxide of zinc, is much used in house-painting, and as a water-colour is known as Chinese white. Baryta white, or sulphur of baryta, is often mixed with white lead, as it helps to preserve its tint.

**Whiting,** a delicate fish of the cod family (*Gadus merlangus*), found off the European coasts from Norway to the Mediterranean. It is especially abundant on the south and west coasts of England and Ireland. Whiting is also the name given to chalk, ground and purified.

**Willow Rods,** thin twigs of willow used for basket-work. *See* **Osiers.**

**Wincey,** or Winsey, a cloth of wool with an admixture of cotton.

**Wine.** *See* Plate 89.

**Wintergreen.** Oil of wintergreen is obtained by distillation from *Gaultheria procumbens*, a plant of North America, and also from birch bark, which contains the same principle. Methyl salicylate is sold as artificial oil of wintergreen. The oil serves as an aromatic for perfuming soap and flavouring beverages, and in North America is a favourite domestic medicine.

**Wire.** Iron wire is made thick, in forges, and used for telegraphy, cables, nails, &c., or drawn fine through a hole in a plate of steel or black diamond in a drawing-mill, when it is worked up into pins, small nails, carders, gauze, &c. Steel has to a large extent taken the place of iron for needles and hooks, cables, strings for instruments, &c. Brass and copper wires are formed into a number of articles, and gold and silver wire are employed in ornaments. The chief producing countries are Great Britain, Germany (especially Bavaria), France, and the United States (Chicago and Illinois).

**Woad.** Dyer's woad (*Isatis tinctoria*) is a plant of the order Cruciferæ, which yields a permanent blue dye. It has been almost entirely superseded by indigo, but is still cultivated near Boston, England, in France, and one or two other countries. It is now mixed with indigo.

**Wolf.** Skins of the common wolf (*Canis lupus*) are exported from Russia, Sweden, and other European countries, and from North America come the darker skins of *C. occidentalis.* The skins are tanned as well as made into furs.

**Wolfram,** or Wolframite. *See* **Tungsten.**

**Wolverene.** The glutton, or wolverene (*Gulo luscus*), is an animal of the weasel family, which inhabits the north of Europe, Asia, and America. Its fur is of some value, and skins are obtained, chiefly in America.

**Wood.** Some woods are sought after for cabinet work, such as mahogany, walnut, palisander, butternut, rosewood, boxwood; others for their dye, as logwood, Brazil wood, camwood, sappanwood, and sanderswood. All these are described under separate headings. *See* also **Timber.** (Plate 157.)

**Woodchucks,** a name for the American marmots, the skins of which are articles of commerce.

**Wool.** *See* Plate 113.

**Wrappers,** wrappers for woollen bales, now generally made of jute and exported from India. *See* **Gunny.**

**Worm Seed.** *See* **Santonin.**

**Wormwood.** Common wormwood (*Artemisia absinthium*) and one or two other species are used in the manufacture of absinthe. Infused they yield a wholesome tonic. Tarragon vinegar owes its flavour to *A. dracunculus.*

**Worsted.** *See* **Wool.**

**Wurrus,** or Waras, the yellowish red glands on the fruits of *Mallotus Philippensis*, furnish in India a useful colour for dyeing.

**Yak,** a species of ox (*Bos grunniies*) which lives in Tibet and the adjoining highlands of Central Asia. Its long silky hair is spun into ropes and woven into tent coverings, and the soft fur on the hump into strong cloth. The white bushy tails are used in India as fly-flappers.

**Yams,** the tubers of several species of *Dioscorea*, most of which grow within the tropics. *D. sativa* is the common yam of the West Indies, and *D. globosa* is the most esteemed kind in India. They will keep when dried for some weeks, and are exported in small quantities, and yield a kind of arrowroot.

**Yarn,** the trade name for spun thread or twist of cotton, flax, wool, silk, or jute, which is used in weaving, and is made into sewing-thread by twisting several strands together. Yarn is made into several different counts, as they are called. For instance, No. 16 cotton means that sixteen hanks, each 840 yards long, weigh one pound. Germany and some other continental countries employ this system. In France the hank is 1000 metres long, and the unit of weight is half a kilogramme. For woollen yarn there is great diversity in the counts. In Great Britain it is numbered like cotton, but the hank is only 560 yards in length. In Germany worsted yarn is treated just like cotton; in France the length of the hank is usually 710 or 714 metres. The counts of flax yarn are also various, but the English system, with some modifications, is the most general; and in this the unit of length is the cut of 300 yards.

**Yeast,** the brownish frothy substance used in leavening bread and in fermenting beer, &c. Its action is due to the presence of innumerable one-celled microscopic organisms (*Saccharomyces*), of which there are numerous species. Dried and pressed yeast is made chiefly in Germany from rye and barley malt. The yeast is treated with carbonate of ammonia, deprived as far as possible of its water, and compressed into a yellowish brittle mass, in which state it is exported.

**Yellow Berries,** berries of various species of buckthorn used in dyeing. The best are Persian berries, the fruit of *Rhamnus infectoria*, and from this species Avignon berries are also obtained. *R. saxatilis* grows in Asia Minor and the south of Europe; *R. cathartica* in the south of Europe and Germany.

**Yellow Metal,** an alloy of copper and zinc, much used in sheathing ships' bottoms. *See* **Brass.**

**Yellow Ochre.** *See* **Ochre.**

**Ylang-Ylang,** an essential oil extracted from *Cananga odorata*, which grows in Java and the Philippines, and is cultivated in many tropical countries. It is used in perfumery, being little, if at all, inferior to attar of roses. The Manila oil is the best, and sells at from £8 to £11, 10s. per lb.

**Yucca.** *Yucca filamentosa*, the silk-grass or bear-grass of Florida, is a plant of the order Liliaceæ. From this and one or two closely allied species a fibre similar to that of the agaves and bromelias is obtained. In California paper is made of it. Manioc is often called by this name in America.

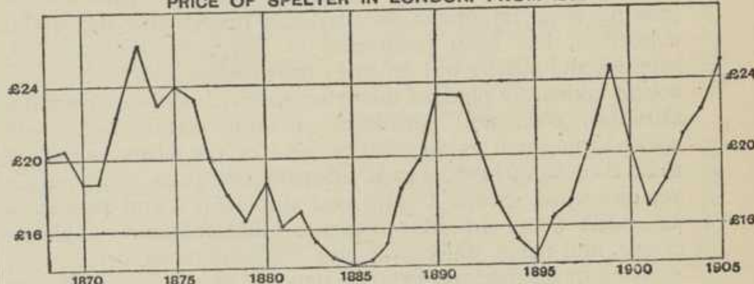
**Zaffre,** impure oxide of cobalt, used in making smalt. *See* **Cobalt.**

**Zebra Wood,** a light-brown wood with dark stripes, derived from *Omphalobium Lambertii*, a tree of Guiana. Another kind from Brazil is the wood of *Centrolobium robustum*.

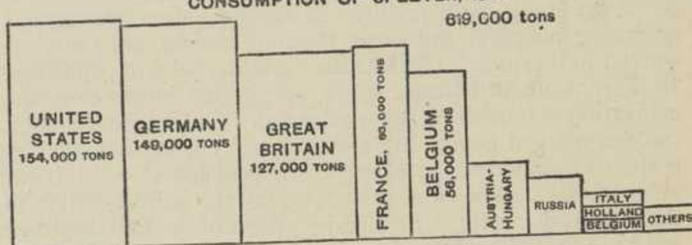
**Zedoary.** The roots of *Curcuma zedoaria*, or *zerumbet*, are aromatic and tonic, and serve the same purposes as ginger. They grow in India, China, and other south Asiatic countries. Some are round and others long.

**Zinc.** One of the more common and important metals. The commonest ore is the sulphide, called sphalerite and zinc blende. The silicates, willemite and calamine, and the carbonite, smithsonite, also yield a considerable proportion of the zinc that is mined. Among the localities where zinc is obtained the chief are in Belgium and the Rhineland, between Liége and Aix-la-Chapelle, Upper Silesia, France (the Cévennes and Provence), Great Britain, and the United States (especially Illinois, Kansas, and Missouri). The metal smelted from the ore is called spelter. Zinc can be hammered out into sheets, and is used for roofing. It is also used for engraving plates and in the composition of alloys. Galvanized iron is iron dipped in molten zinc. Zinc oxide forms the pigment known as zinc white, and is an ingredient in other pigments. The sulphate, formerly known as white vitriol, is used in calico-printing, in varnishes, and in medicine. The chloride is a disinfectant and antiseptic.

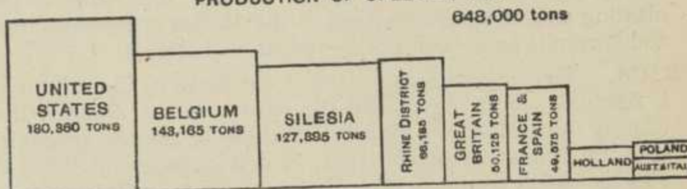
PRICE OF SPELTER IN LONDON, FROM 1868




CONSUMPTION OF SPELTER, 1904




PRODUCTION OF SPELTER, 1905



# DEVELOPMENT OF NEW LANDS

In the diagrams and text of the Atlas the present production of the chief articles of commerce is shown, and where the quantities are small they are collected together under the heading "Other Countries." It is, therefore, proposed on this page to pass briefly under review those regions in which wide areas are still undeveloped, and which are capable of adding largely to the supplies of the commodities most in demand.

**ASIA.**—The vast area of **Siberia** is as yet scarcely touched. Along the southern boundary the agricultural zone is capable of bearing large crops of cereals and feeding large flocks and herds. During the last few years considerable quantities of butter and some grain have been forwarded from Western Siberia to the Baltic ports, wheat-growing is being extended in the Amur province, and Transbaikalia exports cattle to the Amur. The forest zone may yield increased supplies of timber when there are better facilities for transport. Gold in placers is the chief mineral now obtained; a little iron and copper are also extracted, but the mineral wealth of the country may be greatly developed. In **Russian Central Asia** cotton-growing is an important industry, and though the area under cultivation has been contracted in the last few years, the supplies and quality will probably increase gradually, American cotton taking the place of the native variety. Copper, graphite, alabaster, coal, and petroleum in some places have been worked to a small extent, but the value of the minerals has yet to be thoroughly investigated. **Persia** contains many minerals yet unworked, except a little coal and copper, and petroleum has been found in Mesopotamia. **Manchuria** produces cereals and pulse, which will now probably be exported in increasing quantities, and contains deposits of coal, argentiferous lead, &c.; the coal of Fuchung, east of Mukden, is reported to be of extremely good quality. In **Korea** cotton-growing is a promising industry, and other minerals besides gold may be worked in the future. **Zakhalin** contains coal and petroleum. In French **Indo-China,** where rice is the chief crop, the cultivation of tobacco is being extended. Cotton, india-rubber, cardamoms, and pepper are also grown. The mining industry is almost confined to the extraction of coal and a little tin, but other metals are known to exist. Under the administration of the United States the agricultural products of the **Philippines** will be increased, and the deposits of coal and iron be exploited. **Borneo,** both British and Dutch, contain land suitable for planting tropical products; and in the British possessions iron and chromite have been discovered, as well as coal.

**AFRICA.**—The largest area in the world awaiting development is **Africa.** From Egypt and the Sahara to the Zambesi the country is capable of producing all kinds of tropical products, and the utilisation of its lands from a commercial point of view is hardly commenced. Cotton is being introduced into the Egyptian Sudan, and is exported in small but increasing quantities from the European colonies of Guinea, Portuguese East and West Africa, &c. In Nigeria it is grown in small patches for home use, and may be raised in larger quantities for export, and Uganda is a promising field. The export of cocoa from the Gold Coast, Togoland, and Kamerun is increasing; rubber is obtained from all parts, and both the native kicksias and landolphias and the American rubber trees are planted in small numbers. The forests yield other valuable products, such as mahogany and other timber, gum-arabic, copal, palm-oil, &c. The only mineral of importance at present is gold. The exports from the Gold Coast have increased very considerably in the last few years, and extensive deposits are reported on the eastern shore of Victoria Nyanza. Iron exists in many places, galena and tinstone in Nigeria, but of the mineral wealth of Central Africa very little is known at present. In this region the exploitation of the vegetable and mineral resources must depend on native labour, except in a few small elevated areas where the climate is comparatively cool. In the south the land lies at a high elevation, the temperature is lower, and native labour is not so absolutely essential. Southern Rhodesia is capable of producing a large variety of crops, and is making great progress. Besides cereals, tobacco of good quality is grown, and coffee, rubber, and cotton have been experimented with. These crops, as well as tea, are also raised in Nyasaland, where, however, at present the plantation industry suffers from want of cheap transport. Gold is extracted in Rhodesia in rapidly increasing quantities; copper lodes have been opened up in the Lomagundi and Victoria districts, coal is mined at Wankie, and the diamond mines of Gwelo are reported to be rich. The Transvaal is another colony where minerals, besides gold, may be worked to advantage. Copper, tin, galena, magnesite, and cinnabar have been discovered. Copper is also found in German S.W. Africa, and the output of gold in Madagascar has been greatly increased.

**NORTH AMERICA.**—**Canada** contains large areas of unoccupied lands. In the fertile belt, extending from Lake Winnipeg to the Rocky Mountains and from the international boundary to the Saskatchewan River, there are still 140 million acres available for settlement, and extensive areas farther north may be brought under cultivation. The lumber industry will long continue to be important, and by proper forest regulation a supply of timber may be maintained. Gold, copper, asbestos, and nickel have lately been discovered at Lake St. John in Quebec, many minerals in the west are still imperfectly worked, and the northern regions may contain unexpected resources. **Alaska** is likewise rich in minerals, of which only gold and a little coal and copper are at present extracted. Fishing is a profitable industry, and canning; and the establishment of a breeding-station for the foxes on the Pribylof Islands suggests that, as the supply of furs falls off, many of the Arctic lands, both in the Old and New World, might be utilised as preserves. In **Newfoundland,** though the climate is somewhat severe, agriculture might be more extended, and the mineral wealth of the island, as well as of its dependency in Labrador, offers opportunities for the investment of larger capital. The **United States** have about 574 million acres at the disposal of settlers, most of it lying west of the Mississippi. Of this a large part is sterile, or can be rendered productive only by artificial irrigation, but it is estimated that there are in the western states about 365 million acres of grazing land. New mines are frequently discovered. The iron of Alabama, richer than was expected, will probably play an important part in the iron industry of the southern states, and the opening of rich deposits of native sulphur in Louisiana has already had a marked effect on the exports of Sicily. **Mexico** is particularly rich in metals, and the mining industry has made great progress during the present century. The output of copper has been nearly trebled, and attention is now being turned to tin, a metal unusually scarce at the present time. In the **West Indies** the growing cultivation of cotton and the opening of the petroleum deposits of Trinidad are the most important recent events.

**SOUTH AMERICA.**—In **Central America** and a large part of South America there is ample room for more extensive cultivation and greater development of the mineral wealth. The climate, in many districts hot, damp, and unhealthy; the apathy of the inhabitants, in many countries chiefly natives and half-breeds; the instability of the government; and the absence of easy means of transport, retard progress in many of these republics. In the basins of the Orinoco and Amazons are extensive regions where little is obtained but natural forest products, such as timber, rubber, balata, tonkin nuts, &c., and considerable areas still unexplored. Cattle-grazing on a much larger scale might be carried on in the llanos of Venezuela, which have been nearly depleted during the frequent revolutions, on the savannahs of Colombia, in many of the tributary valleys of the Amazons, and on the eastern plains of Bolivia. Minas Geraes contains minerals not yet thoroughly exploited, and the highlands of Goyaz and Matto Grosso are very thinly populated. In the southern provinces of Brazil, Parana, Rio Grande do Sul, and Santa Catherina, which enjoy a comparatively temperate climate, many European colonies are established, and the discovery of coal will cheapen the means of transport. The southern countries of South America are the most progressive, especially **Argentina,** where the exports of wheat, maize, linseed, wool, frozen meat, and dairy products are increasing rapidly. There are vacant lands in almost all parts of the republic where agriculture or grazing may be carried on. Good agricultural land lies along the Chilian boundary, much of which has been assigned by arbitration to Argentina; but it is not easy of access, being cut off from the Pacific coast by almost impenetrable forest. The Andean provinces are undoubtedly rich in metals, but hitherto there has been little extraction. Rich copper ore has lately been discovered between Salta and Tucuman, not far from the railway. **Chile,** especially in the fertile longitudinal valley, **Bolivia** in the Yungas, and the Andean valleys of **Peru** contain lands well adapted for agriculture on a more extensive scale, but in the two latter especially means of transport are much needed. Bolivia is rich in ores—gold, silver, copper, and tin; but there is room for a much greater development, and the mines of Chile and Peru are not yet thoroughly investigated.

**AUSTRALASIA.**—In the interior of **Australia** we find extensive areas which may be utilised with the aid of irrigation. In Queensland tropical products, such as sugar-cane, thrive, and cotton would be more extensively grown if the profits were greater than are earned by sugar. The Northern Territory of South Australia is also said to be well suited to the growth of this fibre, and experiments have been made in New Guinea. New gold deposits have been discovered in New South Wales, and there is room for expansion in the development of the other mineral resources. **New Zealand** has considerable mineral wealth, on which more capital and labour might be expended. Plenty of land is not yet taken up, and new crops might be advantageously introduced; in Otago, for example, beetroot is said to be the crop of the future.

# PRINCIPAL WORLD TRAVEL ROUTES

**ABBREVIATIONS.**—A. L.=Austrian Lloyd. Am.=American Line. Am.-Austr.=American and Australian Line. B. & A. S. N.=British and African Steam Nav. Co. B. & C.=British and Colonial S.S. Co. B. I. S. N.=British India Steam Nav. Co. Can.-Austr.=Canadian Australian Royal Mail S. Line. Cent.-Am.=Central American Steamship Co. C. G. T. N.=Cie. Générale Transatlantique. C. T.=Compaña Transatlantica. C. P. R.=Canadian Pacific Railway and its steamers. D. O. A. L.=Deutsche Ostafrika Linie. D. W. I. M.=Royal Dutch West Indian Mail. G. S. N.=General Steam Nav. Co. Ham.-Am.=Hamburg-American Line. Lamport=Lamport and Holt. L. H. and H.=Leith, Hull and Hamburg. M. M.=Messageries Maritimes. N. D. L.=Norddeutscher Lloyd. Ned. S.=Nederland Steamship Co. N. Y. K.=Nippon Yusen Kaisha. N. Z. S.=New Zealand Steamship Co. O. & O.=Occidental and Oriental Line. P. M.=Pacific Mail. P. & O.=Peninsular and Oriental. P. S. N.=Pacific Steam Nav. Co. R. M. S. P.=Royal Mail Steam Packet Co. Rub.=Florio-Rubattino Co. (now Navigazione Gen. Italiana). Shaw=Shaw, Savill and Albion Line. U. C.=Union-Castle Line. W. I. & P.=West India and Pacific Line.

| Destination. | Departure from | Route. | Distance in Miles. | Approximate Time in Days. |
|---|---|---|---|---|
| Accra | Liverpool | B. & A. S. N. | 3844 | 25 |
| " | Hamburg | Woermann Line | .. | .. |
| Adelaide | London | *Direct Sea*—P. & O.; Orient; Lund's | 11,100 | 43 |
| " | Southampton | *Direct Sea*—N. D. L. | 11,446 | 45 |
| " | Marseilles | *Direct Sea*—M. M. | 9240 | 33 |
| Aden | London | *Direct Sea*—P. & O.; B. I. S. N. | 4777 | 19 |
| " | Southampton | *Direct Sea*—N. D. L. | 4975 | 20 |
| " | Marseilles | *Direct Sea*—M. M. | 2898 | 10 |
| Albany | London | *Direct Sea*—P. & O.; Orient Line | 10,093 | 39 |
| " | Marseilles | *Direct Sea*—Messageries Maritimes | 8215 | 26 |
| Alexandria | London | Overland via Brindisi, and P. & O. | 2275 | 6 |
| " | " | Overland via Naples, thence Rub. | 2377 | 6 |
| " | Liverpool | *Direct Sea*—Moss & Papayanni Lines | 3027 | 14 |
| Algiers | London | Overland by Marseilles and C. G. T. | 1239 | 3 |
| " | Dover | *Direct Sea*—D. O. A. L. | .. | .. |
| " | Liverpool | *Direct Sea*—Moss Line | 1665 | 8 |
| Algoa Bay | Southampton | *Direct Sea*—U. C. | 6340 | 22 |
| Antigua | " | *Direct Sea*—R. M. S. P. | 3830 | 15 |
| Antwerp | London | Gt. Eastern Raily. via Harwich | 191 | 12 hours |
| " | Leith | *Direct Sea*—Gibson's Steamers | 400 | 30 hours |
| Apia (Samoa) | San Francisco | *Direct Sea*—Am.-Austr. Line | 4200 | 14 |
| Athens | Liverpool | *Direct Sea*—Moss & Papayanni Lines | 2635 | 14 |
| " | London | Via Marseilles and M. M. or Fraissinet Co. | 1890 | 6 |
| " | " | Via Brindisi and Rub. | 2046 | 5 |
| Auckland | " | *Direct Sea*—N. Z. S.; Shaw | 12,120 | 46 |
| " | " | Via New York, San Francisco; and Am.-Austr. Line | 12 615 | 30 |
| Bahia | Southampton | *Direct Sea*—R. M. S. P. | 4505 | 16 |
| " | Liverpool | *Direct Sea*—P. S. N. | 4430 | 19 |
| Barbados | Southampton | *Direct Sea*—R. M. S. P. | 3635 | 12 |
| " | Liverpool | *Direct Sea*—W. I. & P. | 3730 | 14 |
| Batavia | Marseilles | *Direct Sea*—M. M. | 7178 | 27 |
| " | London | *Direct Sea*—B. I. S. N. | 8780 | 37 |
| " | Southampton | *Direct Sea*—Ned. S. | 8330 | 36 |
| Beira | London | *Direct Sea*—U. C.; B. I. S. N.; Natal Line | 7560 | 30 |
| " | Hamburg | *Direct Sea*—D. O. A. L. | 8185 | 40 |
| Belize | New York | Cent.-Am. | 1708 | 8 |
| Bergen | Hull | *Direct Sea*—Wilson Line | 452 | 2 |
| Berlin | London | Via Queenborough and Flushing or Harwich and Hook of Holland | 729 | 26 hours |
| Beyrout | Liverpool | Papayanni Line, and Prince Line | 3296 | 12 |
| Bombay | London | Overland route via Brindisi—P. & O. | 5439 | 16 |
| " | " | Overland route via Naples—Rub. | .. | .. |
| " | " | *Direct Sea*—P. & O., B. I. S. N. | 6658 | 25 |
| " | Liverpool | *Direct Sea*—Anchor Line; City Line; Hall Line | 6255 | 27 |
| " | Marseilles | *Direct Sea*—M. M.; P. & O. | 4925 | 16 |
| Bordeaux | London | *Direct Sea*—G. S. N. | 725 | 60 hours |
| " | " | Overland via Dover, Calais, and Paris | 645 | 22 hours |
| Boston | Glasgow | *Direct Sea*—Allan and State Lines | 2785 | 10 |
| " | Liverpool | *Direct Sea*—Dom.; Leyland; Cunard | 2932 | 9 |
| " | London | *Direct Sea*—Wilson & Furness | 3030 | 10 |
| Brindisi | " | Dover, Calais, Paris, and Mont Cenis or Simplon | 1450 | 47–58 hours |
| " | " | Dover, Brussels, and St. Gothard | 1544 | 47–58 hours |
| Brisbane | " | *Direct Sea*—B. I. S. N.; P. & O.; Orient | 12,314 | 50 |
| Buenos Ayres | Southampton | *Direct Sea*—R. M. S. P.; N. D. L. | 6126 | 22 |
| " " | Liverpool | *Direct Sea*—P. S. N.; Lamport | 6253 | 25 |
| " " | London | *Direct Sea*—Houlder Line | 6316 | 27 |
| Cairo | " | Via Naples and Alexandria—Rub. | 2507 | 7 |
| Calcutta | " | Via Brindisi, P. & O.; Bombay | 6493 | 19 |
| " | " | *Direct Sea*—B. I. S. N. | 8261 | 35 |
| " | Liverpool | *Direct Sea*—Anchor and City Lines | 7985 | 34 |
| Callao | " | *Direct Sea*—P. S. N. | 9895 | 40 |
| Cape Coast Castle | " | *Direct Sea*—B. & A. S. N. Co. | 3778 | 26 |
| Cape Town | London | *Direct Sea*—Shaw; N. Z. S.; Aberdeen Line | 6291 | 19–22 |
| " | Southampton | *Direct Sea*—U. C. | 6010 | 19–24 |
| Chicago | Liverpool | By Cunard, White Star, &c. Lines, via New York | 4082 | 9 |
| " | Southampton | By N. D. L., via New York | 4082 | 9 |
| Christiania | Hull | *Direct Sea*—Wilson Line | 558 | 2 |
| Christiansand | Leith | *Direct Sea*—Leith, Hull, & Hamburg Co. | 395 | 36 hours |
| Colombo | London | Overland route, P. & O.; B. I. S. N.; Orient | 5868 | 17 |
| " | Southampton | *Direct Sea*—N. D. L. | 7068 | 26 |
| Colon | " | *Direct Sea*—R. M. S. P. | 5252 | 19 |
| Constantinople | London | Via Brussels, Vienna, Belgrad | 1820 | 71 hours |
| " | Liverpool | *Direct Sea*—Moss & Papayanni Lines | 3015 | 10 |
| Copenhagen | London | Overland via Ostend | 780 | 33 hours |
| " | Leith, Hull | *Direct Sea*—L., H., & H. Co.; Wilson | 616 (Leith) | 58 hours |
| Corfu | London | Via Brindisi, thence by Rub. | 1567 | 3½ |
| " | Liverpool | *Direct Sea*—Papayanni | 3232 | 12 |
| Cyprus | London | Via Trieste and by A. L. | 2881 | 10 |
| Delagoa Bay | " | *Direct Sea*—B. & C.; Natal Line | 7217 | 26 |
| " " | Southampton | *Direct Sea*—U. C. | 6917 | 26 |
| " " | Hamburg | *Direct Sea*—D. O. A. L. | 8640 | 41 |
| Demerara | Southampton | *Direct Sea*—Royal Mail; Dem., Berbice, and Direct Lines from London | 4030 | 14 |
| " | Amsterdam | *Direct Sea*—D. W. I. M. | 4100 | 14 |
| Dunedin | London | *Direct Sea*—Shaw; N. Z. S. | 13,013 | 46 |
| Durban | | *See* Natal. | | |
| Falkland Islands | " | *Direct Sea*—Kosmos S.S. Co. | 7030 | 29 |
| Fiji Islands | Vancouver | *Direct Sea*—C. P. R. Steamers | 5235 | 18 |
| " | Sydney | *Direct Sea*—C. P. R. Steamers | 1725 | 6 |
| Genoa | London | Overland via Calais | 886 | 31 hours |
| " | Southampton | *Direct Sea*—N. D. L. | 2134 | 8 |
| " | Glasgow | *Direct Sea*—Anchor Line | 2254 | 10 |
| Gibraltar | London | *Direct Sea*—P. & O.; Orient; Forwood; Moss; Hall's Line, &c. | 1299 | 5 |
| Gothenburg | " | *Direct Sea*—Thule S.S. Co. | 644 | 3 |
| " | Hull | *Direct Sea*—Wilson Line | 515 | 3 |
| Guadeloupe | Southampton | *Direct Sea*—R. M. S. P. | 3441 | 14 |
| Guernsey | " | By S. W. R. Steamer, or from Weymouth by G. W. R. Steamer | 103 | 9 hours |
| Halifax | Liverpool | *Direct Sea*—Allan; Beaver; Dom. | 2415 | 7 |
| " | London | *Direct Sea*—Furness Line | 2685 | 7 |
| Havana | Liverpool | *Direct Sea*—W. I. & P., or via New York and Ward Line | 585 | 2 |
| Hobart | London | *Direct Sea*—Shaw; N. Z. S., via Melbourne | 11,951 | 41 |
| Hong Kong | " | *Direct Sea*—P. & O.; Ben; Glen; and Shire Lines | 9799 | 41 |
| " " | Southampton | *Direct Sea*—N. D. L. | 10,075 | 39 |
| " " | Marseilles | *Direct Sea*—M. M. | 8180 | 30 |
| " " | Liverpool | Canadian Pacific via Vancouver | 10,686 | 40 |
| Honolulu | London | Via New York and S. Francisco; Am.-Austr.; O. & O.; P. M. | 8715 | 18 |
| " | Liverpool | Via Montreal, Vancouver, and Can.-Austr. | .. | .. |
| Iceland | Leith | *Direct Sea*—(Also from Copenhagen) | 1050 | 6 |
| Jacmel (Haiti) | Amsterdam | D. W. I. M. | 4447 | 15 |
| " " | Havre | C. G. T. | .. | .. |
| Jamaica | Southampton | *Direct Sea*—R. M. S. P. | 4702 | 16 |
| Jersey | " | L. & S. W. Rly. Steamers, or from Weymouth, G. W. R. | 145 | 11 hours |
| Jerusalem | London | Via Naples, Alexandria, and Jaffa | 2727 | 9 |
| Johannesburg | London | Via Cape Town | 7080 | 21 |
| Karachi | " | *Direct Sea*—P. & O.; B. I. S. N. | 6658 | 27 |
| " | Liverpool | *Direct Sea*—Hall; Anchor; and City Lines | 6035 | 28 |
| Khartum | | Via Port Sudan and Berber and Nile Rlys. | .. | .. |
| Klondyke | Victoria (B.C.) | Via Chilkoot Pass (1575 m.); White Pass (1567 m.); Teslin Lake | 1670 | .. |
| Lagos | Liverpool | *Direct Sea*—B. & A. S. N. | 4071 | 29 |
| Las Palmas | London | *Direct Sea*—U. C.; Forwood; and Natal Lines | 1714 | 7 |
| Lima | Liverpool | P. S. N. to Callao, thence rail | 9904 | 40 |
| Lisbon | London | Overland via Paris and Madrid | 1450 | 51 hours |
| " | Liverpool | *Direct Sea*—P. S. N.; Booth; C.T. | 973 | 4 |
| " | Southampton | *Direct Sea*—R. M. S. P. | 855 | 3 |
| Madagascar | London | *Direct Sea*—U. C. via Durban | 8388 | 27 |
| " | Marseilles | *Direct Sea*—M. M. to Tamatave | 6077 | 25 |
| Madeira | London | *Direct Sea*—U. C.; Forwood; B. & C. | 1480 | 4 |
| " | Southampton | *Direct Sea*—U. C. | 1300 | 4 |
| Madras | London | Overland via Brindisi and Bombay; P. & O.; B. I. S. N. | 6232 | 18 |
| " | Liverpool | *Direct Sea*—Anchor Line | 7265 | 30 |
| Madrid | London | Via Calais, Paris, and Bordeaux | 1040 | 37 hours |
| Malta | " | *Direct Sea*—P. & O.; Clan Line | 2280 | 7 |
| " | Liverpool | *Direct Sea*—Moss Line; Papayanni; Prince Line (from Manchester) | 2240 | 8 |
| Manila | " | *Direct Sea*—C. T. | 9575 | 32 |
| Marseilles | London | Via Paris, Macon, and Lyons | 822 | 23 hours |
| Martinique | Southampton | *Direct Sea*—R. M. S. P. | 3523 | 14 |
| Mauritius | London | U. C. via Durban | 8427 | 22 |
| " | Marseilles | *Direct Sea*—M. M. | 6568 | 22 |
| Melbourne | London | Overland route, P. & O.; Orient | 10,750 | 36 |
| " | Southampton | *Direct Sea*—N. D. L. | 11,931 | 45 |
| " | Marseilles | *Direct Sea*—M. M. | 9720 | 35 |
| Mexico | Liverpool | Via Vera Cruz and Raily. | 5447 | 14 |
| Mombasa | London | *Direct Sea*—B. I. S. N. | 6485 | 22 |
| " | Hamburg | *Direct Sea*—D. O. A. L. | 6905 | 32 |
| Monte Video | Southampton | *Direct Sea*—R. M. S. P.; N. D. L. | 6170 | 22 |
| " " | Liverpool | *Direct Sea*—Houston; P. S. N. Co.; Lamport; MacIver-Nelson | 6095 | 25 |
| Montreal | " | *Direct Sea*—Allan; Beaver; Dom. | 2850 | 9 |
| Moscow | London | Via Berlin and Warsaw | 1791 | 71 hours |
| Mozambique | Hamburg | *Direct Sea*—D. O. A. L. | 7700 | 36 |
| Nagasaki | London | *Direct Sea*—Ben; P. & O.; Shire Line | 10,866 | 48 |
| Naples | " | Via Calais and St. Gothard or Simplon | 1358 | 49 hours |
| Natal | " | *Direct Sea*—B. & C.; U. C.; Natal Line | 6810 | 28 |
| " | Southampton | *Direct Sea*—U. C. | 6628 | 28 |
| " | Hamburg | *Direct Sea*—D. O. A. L. | 8960 | 49 |
| New Caledonia | Marseilles | *Direct Sea*—M. M. to Noumea | 11,354 | 43 |
| New Orleans | London | *Direct Sea*—Prince Line | 4690 | 14 |
| " | Liverpool | *Direct Sea*—W. I. & P. | 4615 | 14 |
| New York | " | *Direct Sea*—Cunard; White Star Line | 3170 | 6 |
| " " | Glasgow | *Direct Sea*—Allan; State; Anchor Lines | 3280 | 8 |
| " " | Southampton | *Direct Sea*—Am.; Ham.-Am.; N. D. L. | 3110 | 6 |
| " " | London | *Direct Sea*—Atlantic Transport; Chesapeake; Wilson & Furness | 3245 | 7 |
| Odessa | " | Overland route via Berlin | 1830 | 3½ |
| " | Liverpool | *Direct Sea*—Papayanni | 3335 | 12 |
| Panama | London | Via Liverpool, New York, and San Francisco—P. M. | 8860 | 10 |
| Penang | " | *Direct Sea*—Ben; Glen; P. & O.; Shire Lines | 7781 | 32 |
| Pernambuco | Liverpool | *Direct Sea*—P. S. N. | 3674 | 15 |
| Pondichery | Marseilles | *Direct Sea*—M. M. | 5618 | 22 |
| Portland (Me.) | Liverpool | *Direct Sea*—Allan Line; Dom. | 2770 | 8 |
| Port Said | London | Overland route, P. & O.; Orient; B. I. S. N.; N. D. L. | 2380 | 6 |
| " | Liverpool | *Direct Sea*—Anchor; Bibby; City; Hall; Henderson | 4050 | 14 |
| " | Marseilles | *Direct Sea*—M. M. | 1568 | 5 |
| Quebec | Liverpool | *Direct Sea*—Allan; Beaver; Dom. | 2855 | 8 |
| Quilimane | Hamburg | *Direct Sea*—D. O. A. L. | 7985 | 45 |
| Rangoon | Liverpool | *Direct Sea*—Bibby; Henderson Lines | 7955 | 36 |
| Réunion | Marseilles | *Direct Sea*—M. M. | 6448 | 27 |
| Rhodesia | | Via Cape and rail, or Beira and rail | | |
| Rio de Janeiro | Liverpool | *Direct Sea*—P. S. N. | 5156 | 19 |
| Rome | London | Via Calais, Turin, and Genoa | 1232 | 43 hours |
| Saigon | Marseilles | *Direct Sea*—M. M. | 7265 | 27 |
| St. John (N.B.) | Liverpool | *Direct Sea*—Beaver Line (also by Furness Line from London) | 2530 | 9 |
| St. John's (N.F.) | " | *Direct Sea*—Allan Line | 2130 | 8 |
| San Francisco | " | Via New York | 6397 | 12 |
| St. Petersburg | London | Via Flushing, Berlin, and Eydkunen | 1750 | 57 hours |
| Seychelles (Mahé) | Aden | *Direct Sea*—M. M. | 1395 | 5 |
| Shanghai | London | *Direct Sea*—Glen Line; P. & O. | 10,540 | 46 |
| " | Southampton | *Direct Sea*—N. D. L. | 10,945 | 43 |
| " | Marseilles | *Direct Sea*—M. M. | 9050 | 36 |
| " | Vancouver | *Direct Sea*—C. P. R. | 4300 | 19 |
| Sierra Leone | Liverpool | *Direct Sea*—B. & A. S. N. | 2957 | 14 |
| Singapore | London | Overland route, P. & O. | 7527 | 26 |
| " | " | *Direct Sea*—P. & O.; Ben; B. I. S. N.; Glen; Nippon; Shire &c. | 8362 | 33 |
| " | Southampton | *Direct Sea*—N. D. L. (also M. M. from Marseilles) | 8638 | 33 |
| Smyrna | Liverpool | *Direct Sea*—Moss and Papayanni Lines | 2923 | 10 |
| " | London | Overland route and Rub. from Naples | 2414 | 6 |
| Stockholm | " | Via Flushing and Copenhagen | 1183 | 50 hours |
| " | " | *Direct Sea*—By Stockholm S.S. Co.; also Wilson Line from Hull | 1171 and 903 | 4 |
| Suez | | Steamers for the East and Zanzibar | 3337 fr. Lond. | 10 |
| Sydney | London | *Direct Sea*—P. & O.; Orient; Aberdeen; Lund's | 12,145 | 48 |
| " | " | Via San Francisco, Am.-Austr. Line | 13,896 | 37 |
| " | Southampton | *Direct Sea*—N. D. L. | 12,491 | 49 |
| " | Marseilles | *Direct Sea*—M. M. | 10,296 | 34 |
| " | Vancouver | C. P. R. Steamers | 6780 | 24 |
| Teneriffe | London | *Direct Sea*—B. & A. S. N.; Forwood; Natal; U. C. | 1714 | 7 |
| Trinidad | Southampton | *Direct Sea*—R. M. S. P. | 3734 | 13 |
| " | Liverpool | *Direct Sea*—W. I. & P. | 3837 | 14 |
| Tunis | London | Via Marseilles, C. G. T. | 1284 | 4 |
| " | " | *Direct Sea*—Prince Line | 2108 | 10 |
| Uganda | " | Via Mombasa, rail, and Victoria Nyanza Steamers | .. | .. |
| Valparaiso | Liverpool | *Direct Sea*—P. S. N. | 8748 | 37 |
| " | London | *Direct Sea*—Kosmos S.S. Co. | 8811 | 40 |
| Vancouver | Liverpool | Allan; Beaver; Dom.; C. P. R. | 5584 | 15 |
| Vera Cruz | " | *Direct Sea*—W. I. & P. | 5031 | 20 |
| Vladivostok | Southampton | *Direct Sea*—N. Y. K. | 11,784 | 50 |
| Wellington | London | *Direct Sea*—Shaw; N. Z. S., also via Sydney | 13,345 | 46 |
| " | Liverpool | Canadian Pacific via Vancouver | 10,452 | 32 |
| Yokohama | " | *Direct Sea*—P. & O.; Shire; Ben; Glen; N. Y. K. | 11,601 | 52 |
| " | | Via San Francisco, O. & O., and P. M. | 11,403 | 30–39 |
| Zanzibar | " | *Direct Sea*—B. I. S. N. | 6625 | 40 |
| " | Marseilles | *Direct Sea*—M. M. | 4745 | 20 |
| " | Hamburg | *Direct Sea*—D. O. A. L. | 7130 | 36 |

# GENERAL GEOGRAPHICAL STATISTICS

## POPULATION OF THE WORLD

| CONTINENTS, &c. | Area in Square Miles. | Population. | Persons to each Square Mile. |
|---|---|---|---|
| Europe | 3,900,000 | 414,000,000 | 106.2 |
| Asia | 17,300,000 | 907,000,000 | 52.5 |
| Africa | 11,530,000 | 141,000,000 | 12.3 |
| North America (including Central America and the West Indies) | 9,200,000 | 113,120,000 | 12.3 |
| South America | 6,850,000 | 39,980,000 | 5.8 |
| Australasia | 3,458,000 | 6,280,000 | 1.8 |
| Antarctica | 2,500,000 | — | — |
| | 54,738,000 | 1,621,380,000 | 29.6 |

## PRINCIPAL STATES, THEIR COLONIES INCLUDED

| STATES. | Area in Square Miles. | Population. | Persons to each Square Mile. | STATES. | Area in Square Miles. | Population. | Persons to each Square Mile. |
|---|---|---|---|---|---|---|---|
| British Empire | 11,412,000 | 392,900,000 | 34.4 | Colombia | 465,700 | 4,630,000 | 9.9 |
| Russian Empire | 8,379,000 | 141,200,000 | 16.9 | Venezuela | 364,000 | 2,591,000 | 7.1 |
| France | 4,445,000 | 90,617,000 | 20.4 | Spain | 276,900 | 19,191,000 | 69.3 |
| Chinese Empire | 4,278,100 | 424,428,200 | 99.0 | Italy | 307,500 | 34,284,000 | 111.8 |
| United States | 3,686,000 | 91,745,000 | 24.9 | Sweden | 158,650 | 5,295,000 | 33.4 |
| Brazil | 3,218,200 | 14,333,915 | 4.5 | Norway | 119,072 | 2,311,000 | 19.4 |
| Ottoman Empire | 1,622,100 | 39,788,000 | 24.5 | Chile | 292,343 | 3,239,000 | 11.1 |
| German Empire | 1,236,600 | 73,421,300 | 59.4 | Siam | 244,400 | 6,070,000 | 24.8 |
| Argentine Republic | 1,117,100 | 5,106,378 | 4.6 | Austria-Hungary | 241,194 | 47,355,000 | 196.3 |
| Congo Free State | 920,000 | 19,000,000 | 20.6 | Afghanistan | 215,400 | 5,000,000 | 23.2 |
| Portugal | 842,500 | 12,874,000 | 15.3 | Central America | 164,400 | 4,174,000 | 25.4 |
| Netherlands | 802,400 | 43,471,000 | 54.2 | Morocco | 170,000 | 5,000,000 | 29.4 |
| Mexico | 767,000 | 13,607,000 | 17.8 | Japan | 175,700 | 51,525,000* | 293.3 |
| Bolivia | 703,600 | 1,816,300 | 2.6 | Ecuador | 118,600 | 1,272,000 | 10.7 |
| Peru | 695,700 | 4,560,000 | 6.6 | Denmark | 102,000 | 2,725,000 | 26.7 |
| Persia | 630,000 | 9,500,000 | 15.1 | Uruguay | 72,153 | 1,038,086 | 14.4 |

* The population of the Japanese Empire is only approximate owing to the absence of data for recent acquisitions.

# COMMERCIAL TERMS IN COMMON USE

**Balance of Trade.** By this term is denoted the difference between imports and exports. In the seventeenth century it was believed that gold and silver were the only real wealth of the country, and that an excess of imports must eventually be paid for by the export of coin or bullion. This was the principle of the "mercantile system," first promulgated early in the seventeenth century, which aimed at the encouragement of export compared to import. Even down to the present day there has been a very prevalent impression that an excess of imports is unfavourable to the prosperity of a country, though an opposite conclusion should properly be drawn from it. In most European countries the balance is on the side of the imports, and, as regards the United Kingdom, has increased enormously as her industries and commerce have extended. There are several reasons why this should be so. Firstly, there are the profits of trade, that is the profits obtained by exchanging the surplus products of one country for goods which can be produced in another country at a lower cost. Secondly, the values of the imports and exports in the ports of, say, the United Kingdom, are their values in this country, and, therefore, to the cost of the former are added freight and insurance. Thirdly, the United Kingdom has a large carrying trade, and the profits derived from it are paid in the form of imports. Lastly, a large quantity of capital is invested abroad, the interest on which is also paid by imports.

**Bale.** Cotton, linen, wool, tobacco, and other articles are shipped in canvas-covered packages called bales. Their weight varies considerably in different countries, and, therefore, instead of bales, bags, &c., weights have been given in the Atlas.

**Bill of Exchange.** An order for the payment of a sum of money written on stamped paper by the creditor or "drawer" and accepted by the debtor. In this country a bill is due three days after the date of payment stipulated on the bill. The drawer sells the bill as a rule to a bill-broker, who deducts a discount from the amount of the bill. Bills drawn by British merchants are sold by the brokers to merchants who owe money in the countries where they are payable.

**Bill of Lading.** A form of receipt signed by a ship's officer for goods consigned to him for transport.

**Bill of Sufferance.** A licence allowing coasting vessels to load or unload at sufferance wharves without paying duty.

**Board Measure.** In America sawn timber is sold by the linear foot, the breadth of the planks being supposed to be 12 ins. and the thickness 1 in.

**Bond.** In all large seaports there are bonded warehouses, where dutiable goods can be stored under the control of the custom officers. The owner can re-export them without payment of duty, or, if he sells them in the country, can defer payment until the goods are wanted, and therefore is not deprived of the use of the sum of money paid for duty while his goods are still on his hands.

**Brokerage.** The commission a broker receives for the sale of goods or for negotiating bargains. It is, as a rule, one per cent.

**Bullion.** Gold and silver in bars or ingots.

**Charter-party.** A written contract for the hire of a vessel or part of it.

**C.I.F.** Cost, insurance, and freight. In the United Kingdom and most other countries the value of the imports given in the official returns includes the freight and insurance as well as the cost in the country of origin.

**Consumption.** By home consumption is not meant, as a rule, only goods applied to the personal use of the inhabitants of a country, but the term includes material worked up in industries and re-exported in a manufactured form, *e.g.* in the case of cocoa. On the other hand, the consumption of such articles as meat and tea in the diagrams may be taken as personal consumption. *See* **Exports and Imports.**

**C.P.** Candle-power. The light of a sperm candle burning 120 grains of sperm in the hour is the unit of illumination. Gas, for instance, of 20 candle-power is gas which, burning in an Argand burner at the rate of 5 cub. ft. per hour, gives out as much light as 20 such candles.

**Clearing House.** At the Bankers' Clearing House in London cheques on different banks are exchanged, and the balance due to, or by, each bank is paid by a cheque on the Bank of England. Thus, payments amounting to two or three hundred millions sterling are adjusted weekly. In the Railway Clearing House the proportions of passengers' fares and the freight of goods are assigned to the several railways concerned, and other claims are settled.

**Customs.** Duties collected on imports and exports. The chief import duties in the United Kingdom are levied on alcoholic liquors, chicory, cocoa, butter, coffee, dried fruit, sugar, and articles preserved with sugar, tea and tobacco. Coal was for a time subject to an export duty of 1s. per ton.

**Demurrage.** An allowance paid by the freighter to the shipowner for the detention of a ship in port after the specified date of sailing.

**Dock Warrant.** An authority endorsed by the owner to enable the holder to remove or sell goods lying in dock.

**Dunnage.** Any loose substance used to pack a ship's cargo and prevent it shifting.

**Exports and Imports.** General exports and imports are the total exports from, or imports into, a country. Special imports comprise those goods which are imported for home consumption, that is, not only articles used personally by the inhabitants of the country, but also materials for home industries, and, indeed, all goods which are subjected to any process before re-exportation, though it be simply sorting. In some countries goods merely put in bond for a time are included in special imports. Special exports include raw materials of home production, the products of home manufacture, and those special imports which are re-exported after re-handling.

**F.O.B.** Free on Board. The values of exports are returned F.O.B., that is, they include all expenses of carriage and loading up to the time they are stowed on board the vessel which is to carry them abroad. Merchants also generally quote prices F.O.B. in writing to foreign correspondents.

**H.P.** Horse-Power. The unit by which the rate of work of a machine is reckoned. The unit of work, called a foot-pound, is the work performed in raising 1 pound to a height of 1 foot in a second, and a horse-power is represented by 550 foot-pounds per second. The French *cheval vapeur* is the work performed in raising 75 kilogrammes through 1 metre in a second, and is equal to about 542 foot-pounds.

**Load.** Timber is bought by the load, which is 40 feet of round timber and 50 feet of hewn timber, and is held to weigh one ton. *See also* **Board Measure and Standard.**

**Load Line.** A line marked on the sides of vessels. When the water rises to this line, the vessel is loaded with as much cargo as it can safely carry at sea.

**Manifest.** A list of a ship's cargo, in which the mark and number of each package is noted, together with the names of the shippers and consignees. It is usually signed by the master or chief officer.

**Primage.** A sum of money paid by shippers and consignees to the master of a vessel for the use of ropes, &c. in loading and unloading.

**Regulus.** Pure metal separated from the ore.

**Standard.** A measure used for Baltic timber. The most commonly used, the St. Petersburg standard, is 165 cub. ft. for deals and battens, 120 ft. for square timber, and 120 ft. for round.

**Tonnage.** The present system of *register* tonnage was introduced in 1854. The space in the hull of a vessel is ascertained by measuring the area of cross sections and the length, and 100 cub. ft. of space is a register ton. Net tonnage is the space available for cargo and passengers, the space occupied by engines, coals, &c. being deducted. Warships are measured by *displacement* tonnage, and yachts by the *Thames rule*. A *freight* ton is an arbitrary measure of 40 cub. ft.

# DATES IN HISTORY OF COMMERCIAL GEOGRAPHY

1492. First voyage of Columbus to America.
1493. Second voyage of Columbus. The sugar-cane introduced into America (San Domingo).
1497. Vasco da Gama sailed to India by the Cape of Good Hope. Sebastian Cabot discovered Newfoundland.
1498. Columbus discovered the mainland of America.
1500. Pedro Cabral discovered Brazil.
1501. Vespucci sailed down the coast of South America.
1509. Lopes de Sequira visited the Spice Islands.
1513. Vasco Nuñez de Balboa saw the Pacific Ocean from a mountain on the isthmus of Panama.
1519. Fernando Cortes commenced conquest of Mexico. Magellan set sail for first circumnavigation of the globe.
1531. Pizarro commenced the conquest of Peru.
1542. Ruy Lopez de Villalobos took possession of the Philippine Islands for Spain.
1557. Francis Drake set sail for the first circumnavigation of the world by British seamen.
1559. Hernandez de Toledo brought the tobacco plant from Mexico to Spain.
1569. Mercator invented his projection.
1580. The Dutch settled in Guiana.
1583. Newfoundland annexed by Great Britain.
1588. The Spanish Armada defeated.
1600. Charter granted to the East India Company.
1602. The Dutch East India Company founded.
1604. Nova Scotia colonised by the French.
1606. Quiros discovered Tahiti and the north-east coast of Australia.
1608. Quebec founded.
1609. Virginia colonised. The first bank in London established.
1623. The Dutch West India Company founded.
1642. Tasman discovered Van Diemen's Land (Tasmania) and Staaten Land (New Zealand). Villa Marie (Montreal) founded.
1647. Peter Stuyvesant founded New Amsterdam, re-named New York when taken by the English in 1664.
1655. Jamaica taken.
1660. Tea, brought from China to England shortly before the Restoration, became a regular import in Charles II.'s reign.
1661. Bombay and the Gold Coast acquired. A Postmaster-General appointed and a penny post started in London.
1670. Charter granted to the Hudson Bay Company.
1674. The French settled in Pondicherry.
1681. Colonisation of Pennsylvania.
1690. The English established themselves at Calcutta.
1694. The Bank of England founded.
1696. *Lloyd's News* first published; the title was changed to *Lloyd's List* in 1726. The Russians reached Kamchatka.
1713. Nova Scotia and New Brunswick ceded to England.
1731. Hadley invented his quadrant, afterwards modified to the sextant.
1733. Georgia colonised.
1749. Halifax founded.
1757. The battle of Plassey, by which the foundation of British supremacy in India was laid.
1763. Canada, Florida, and Grenada ceded to Great Britain.
1767. The *Nautical Almanac* first published.
1768. Cook's first voyage to the Pacific. He made many discoveries from Icy Cape in the Arctic seas down to the Antarctic ice, and was killed at the Sandwich Islands in 1779.
1784. Cotton first exported from Virginia.
1788. First British Colony in Australia (Botany Bay) founded. Sydney founded. The African Association formed.
1789. Mackenzie river discovered.
1791. Washington, capital of the United States, founded.
1794. Toronto (then called York) founded.
1795. Ceylon taken from the Dutch.
1810. Mauritius taken from the French.
1812. The first steamer to work for hire, the *Comet*, was placed on the Clyde.
1822. Denham and Clapperton reached Lake Tsad and Sokoto.
1825. The first passenger railway, the Stockton & Darlington, opened.
1830. The first railway in the United States, the South Carolina, opened.
1836. Melbourne founded.
1837. Wheatstone perfected the telegraph.
1840. Wellington, the first colony in New Zealand, and Auckland founded. The first regular steam liner, the *Britannia* of the Cunard Line, crossed the Atlantic. The Penny Post established in Great Britain.
1845. Waghorn brought the Indian mails by the overland route in one month.
1848. Gold discovered in California.
1849. Repeal of the Corn Laws. The journey of Livingstone along the Zambezi, and the beginning of the opening up of Central Africa. San Francisco grew into a town.
1850. First railway in Canada, Toronto & Bradford, opened.
1851. Discovery of gold in Australia. Telegraph cable completed between Dover and Calais.
1859. Japan thrown open to foreign trade.
1866. First successful telegraph cable laid across the Atlantic.
1867. Union of British provinces in North America under the title of Dominion of Canada. Diamonds discovered on the site of Kimberley, South Africa.
1869. Suez Canal opened. Railway communication established across America by the junction of the Union Pacific and and Central Pacific Railways.
1871. Lloyd's incorporated by Act of Parliament.
1878. Nordenskiöld commenced his circumnavigation of Eurasia. African Lakes Trading Corporation formed.
1879. First Telephone Exchange opened in London.
1881. The Panama Canal commenced.
1882. The Royal Niger Company constituted under the name of the National African Company.
1885. Canadian Pacific Railway completed. Gold discovered in the Transvaal. Upper Burma annexed. Vancouver City founded.
1886. Johannesburg founded.
1888. British East Africa Company incorporated.
1889. British South Africa Company incorporated.
1891. British Central Protectorate proclaimed.
1894. Uganda Protectorate proclaimed.
1895. British East Africa Protectorate proclaimed.
1900. The Transvaal and the Orange River Colony annexed.
1901. Marconi established wireless telegraphic communication between Cornwall and Newfoundland.
1902. Canada and Australia cable laid, completing British telegraphic communication round the world.
1905. Completion of the Siberian railway by the construction of the section round the end of Lake Baikal.

# CORRECTIONS AND ADDITIONS

(*Noted after completion of the work*)

**LIST OF COMMODITIES.—Arsenic.** Arsenic rarely occurs native; the most common ore is mispickel, or arsenical pyrites. **Bananas.** The figures given for the imports are from an early estimate. The correct quantity is given on Plate 100. **Cinchona.** For *cinchonnie* read *cinchonine*. **Clam.** For *Trida nacgigas* read *Tridacna gigas*. **Flour.** The harvest in Australia in 1903 was very poor, and hence the imports from that country into the United Kingdom were very small. In 1905 the quantity was 983,000 cwts. **Lime** (Oxide of Calcium). For *lime juice* read *lime water*.

**Plate 1.** The figures of the trade in 1906 for Germany, the United States, and France have never been published. They are as follows:—Germany, imports £392,527,000; exports £306,250,000: France, imports £209,177,000; exports 201,747,000: United States, imports £271,489,000; exports £364,316,000.

**Plates 14 and 15.** In the diagrams *red* denotes imports and *green* exports.

**Plate 61.** The harvest of 1903 was very poor in Australia, while in the three succeeding years the crop was much more the usual quantity, the average being 65,817,000 bushels.

**Plate 64.** A new diagram of the net imports of wheat into the chief European countries is given below, that at the top of Plate 64 being in some cases defective. Though for some countries the figures may not be quite exact, the order is probably correct. In 1904 great changes took place in the British supply of wheat. The imports from the United States, which had already shown a marked decline, fell suddenly, while Argentina sent much larger quantities. The imports of the principal countries in 1905, flour being represented by its equivalent weight of grain, were, in percentages of the total imports, as follows:—Russia 21.8, Argentina 21.1, India 19.9, the United States 12.7, Australia 10.0, and Canada 7.3. In 1904 India was the largest importer. The total imports in these two years were much larger than previously.

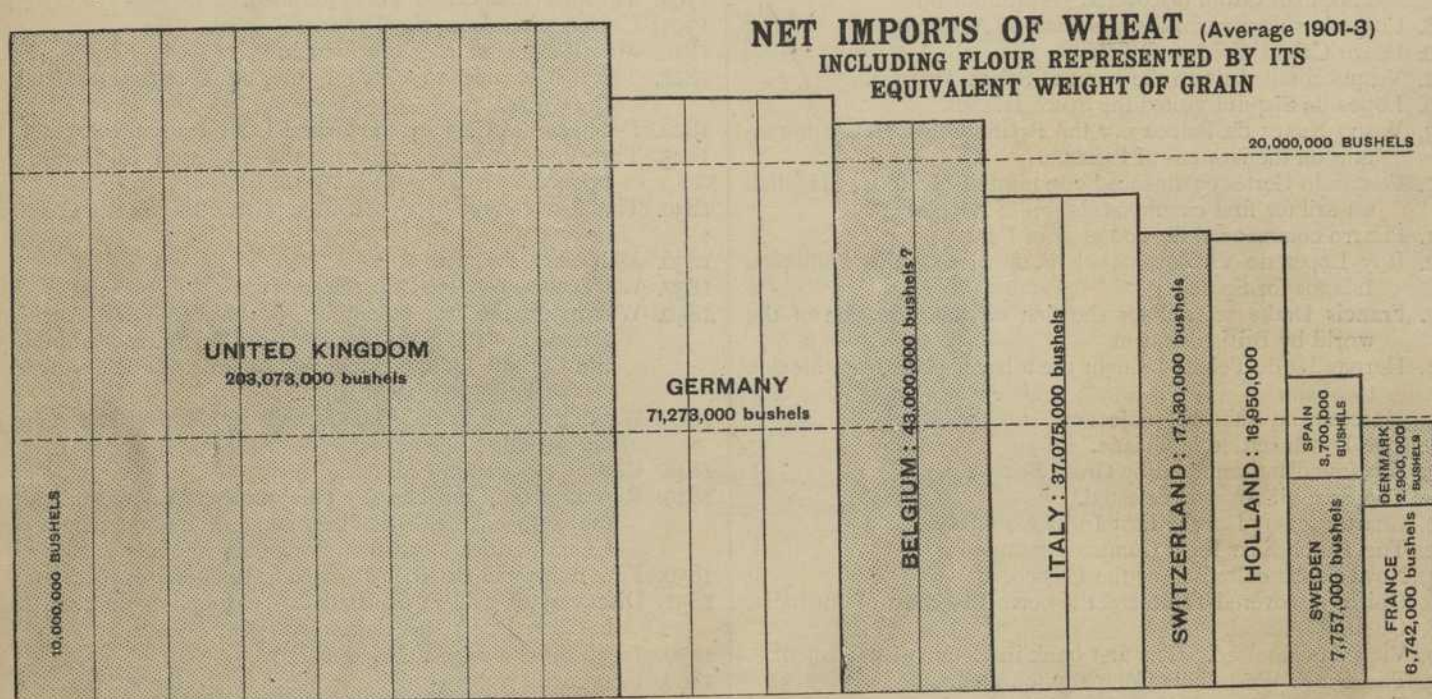



**Plate 73.** Line 11 from the top. For *introgenous* read *nitrogenous*.
The production (estimated) of rye in 1906 is 42,720,000 bushels less than in 1905.

**Plate 76.** The production (estimated) of barley in 1906 is 33,488,000 bushels *more*, not *less*, than in 1905.

**Plate 77.** Line 15 from top. For *the juice contains* 18 *per cent. of raw sugar* read *the cane contains up to* 18 *per cent. of sucrose matter*. This sucrose yields about two-thirds its weight of commercial raw sugar. The quantity of sucrose and the quantity of cane per acre vary considerably, and the yield of raw sugar per acre also varies. For the United States as a whole it is about 17 cwts., and for Hawaii over 70 cwts. The statement on the refining of sugar at the bottom of the page does not apply to cane-growing countries.

**Plate 85.** First line. For *shrub* read *tree*.
Line 16. There are no organised foreign colonies in São Paulo, and most of the planters are native Brazilians.
Line 21. In Brazil the berries are gathered continuously during 120 to 145 days, beginning in April or May.

**Plate 86.** A blue arrow should have been placed against Santos, where two-thirds of the Brazilian export is shipped.

**Plate 97.** Third line from top. After *essential* read *oil*.

**Plate 101.** Under Annual Exports of Dairy Produce, in the sentence "The United States exports less than 9 per cent. of its dairy products," for 9 *per cent.* read 0.9 *per cent.*

**Plate 103.** European Russia should have received the lightest tint, representing an export of less than 2s. 6d. per head.

**Plate 105.** The value for Canada in the diagram of Annual Production of Salmon should be £724,000, not £1,724,000, and therefore the area in the diagram is correspondingly exaggerated.

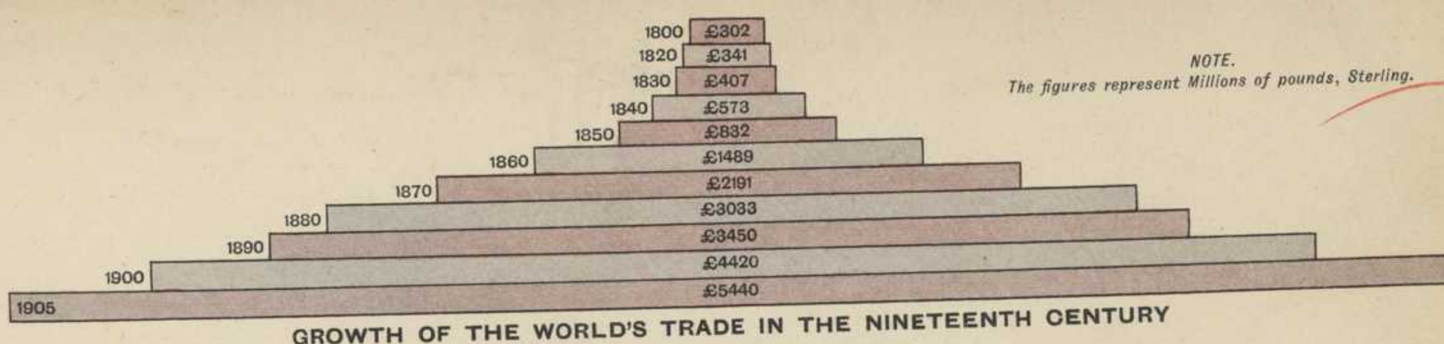
**Plate 131.** Map of importing countries. Australia should not have been coloured, being an *exporting* country. In 1905 it sent out nearly 10 cwts. per head.

**Plate 133.** Australia should not appear in the diagram of imports. The quantity and value there given are those of Australia's *exports*.

**Plate 142.** The title *Alaska* on an inset map should be *Klondike*.

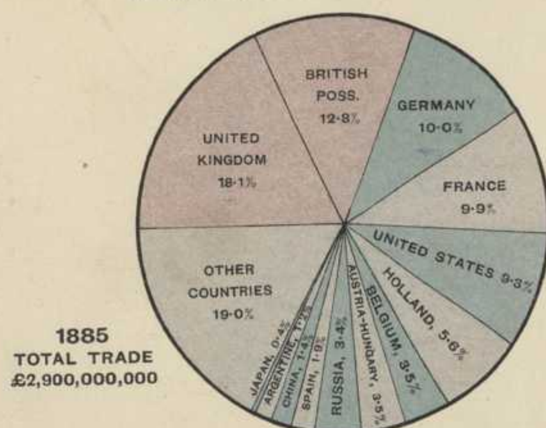
# COMMERCIAL GROWTH OF NATIONS

*NOTE.*
*The figures represent Millions of pounds, Sterling.*

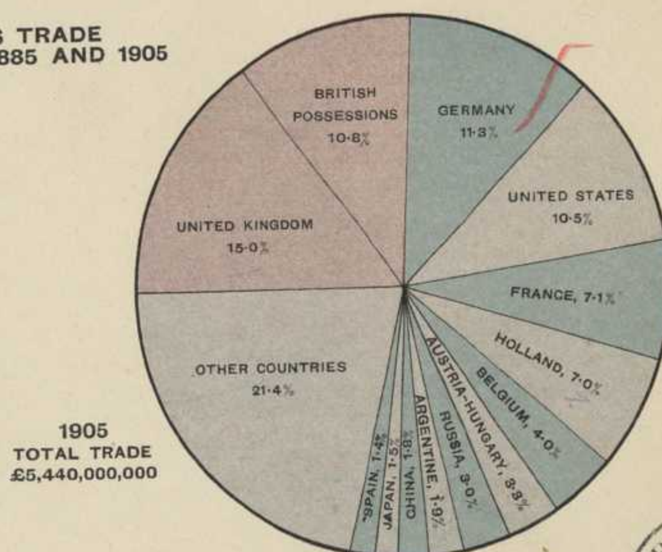



GROWTH OF THE WORLD'S TRADE IN THE NINETEENTH CENTURY

PROPORTION OF THE WORLD'S TRADE HELD BY DIFFERENT NATIONS IN 1885 AND 1905



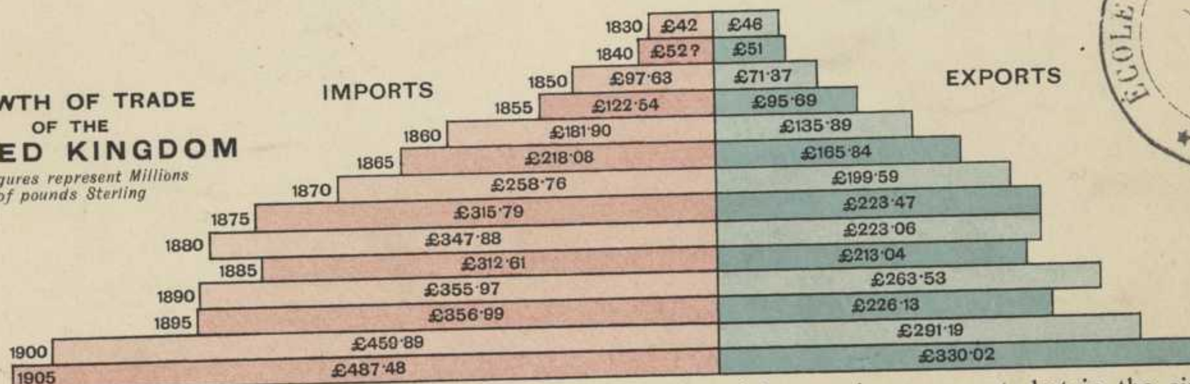

1885
TOTAL TRADE
£2,900,000,000




1905
TOTAL TRADE
£5,440,000,000



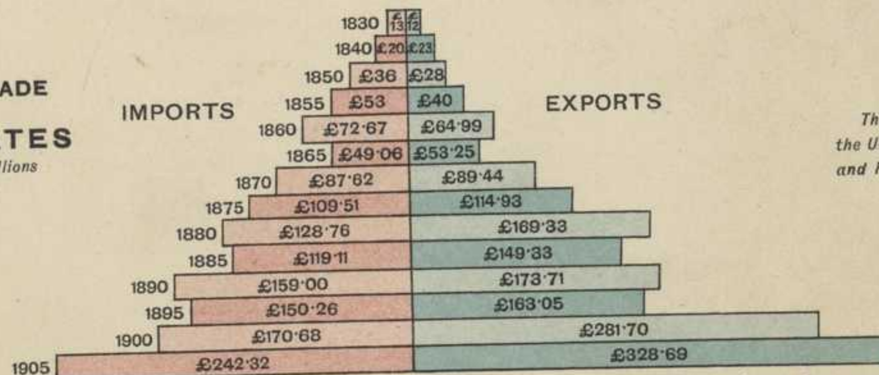

GROWTH OF TRADE OF THE UNITED KINGDOM
*The figures represent Millions of pounds Sterling*



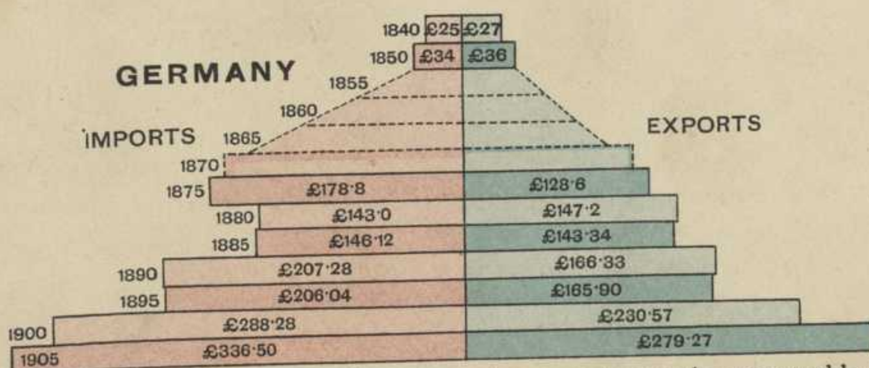

During the five years ending 1905, British commerce increased by nearly 9 per cent., but in the single year 1906, it has risen 10 per cent. (imports 7·4 per cent. and exports 13·6) the total value being nearly 899 millions sterling.

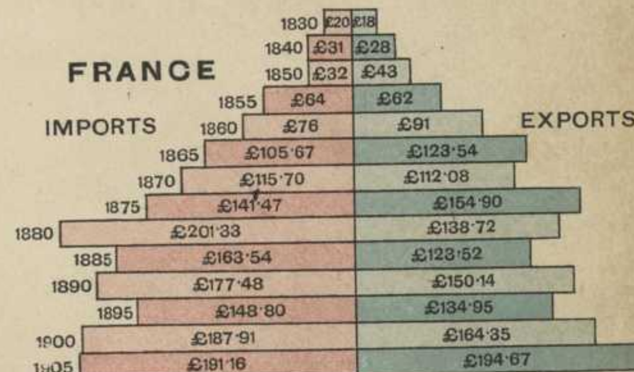
GROWTH OF TRADE OF THE UNITED STATES
*The figures represent Millions of pounds Sterling*

*NOTE.*
*The four diagrams representing the Trade of the United Kingdom, the United States, Germany, and France are all drawn to one scale.*




The exports of the United States exceeded those of the United Kingdom in 1901 and 1903, and also, according to the figures given in the *Board of Trade Journal*, in 1905, but in America, where 4·8665 dollars are taken as equivalent to a pound sterling this is not so reckoned in 1905. For the above figures 4·866 dollars have been taken as equivalent to one pound. During the eleven months of 1906 ending November, the increase over the corresponding period of 1905 is 10 per cent. for imports and 13 for exports, at which rates the total trade for the year will be nearly 638 millions.




The figures for German trade are not exactly comparable before 1889 when the Hanseatic ports were incorporated into the Customs Union. The figures now available for nine months of 1906 show an increase of 14·7 per cent. over those of the corresponding period of 1905.

As a rule the imports into densely populated manufacturing countries exceed the exports, but in 1905 the exports from France exceeded the imports. The figures given for this year are from a French official report published in September 1906. For the eleven months ending November 1906, the increase of trade is 9·5 per cent. for impo[illegible] exports compared to the corresponding period in 1905, and should the same rates [illegible]h December, the value of the year's trade will be nearly 414 millions.

# NATURAL VEGETATION & OCEAN CURRENTS



Note to Monsoon Drifts &c.

*In the Indian Ocean, the China Sea, and the West Coast of Mexico and Central America, the Currents change with the Monsoons. The simple arrows ⟶ show the S.W. and S.E. Monsoon Drift during the Northern Summer. The arrows marked thus ⟵ show the N.W. and N.E. Monsoon Drift during the Northern Winter*

Sea-Weed — Limit of Pack Ice

### EXPLANATION OF LAND COLOURING

- Tropical Forest
- Forest, chiefly Coniferous in Northern Hemisphere
- Mixed Wood and Grassland
- Grassland, partly with Scrub, &c.
- Desert
- Mountain Flora, Arctic and Antarctic Flora
- Tundra

Note to Ocean Currents &c.

Warm Currents — Cold Currents

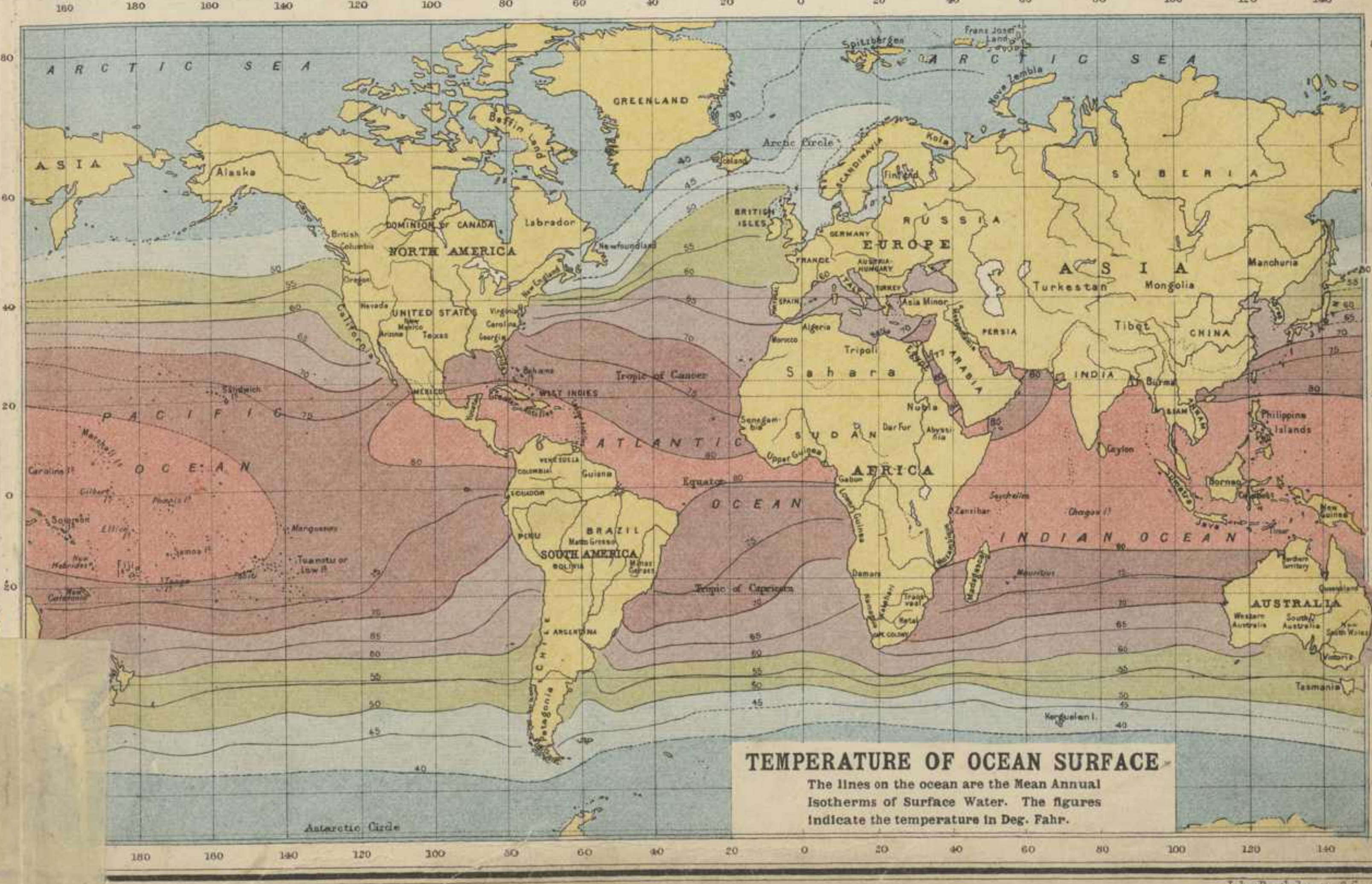
*The direction of the Currents is shown by the arrows. The feathers of the arrows indicate by the number of strokes the mean speed of the water drift in an hour. The thick strokes above indicate the number of nautical miles, the thin strokes below indicate the number of quarters of a mile thus; ⟶ 1 mile ⟶ 2 miles ⟶ 3 miles ⟶ 1¼ " ⟶ 2½ " ⟶ 3¾ "*

### FORMS OF CULTIVATION, &c.

- Horticulture
- Agriculture
- Plantations
- Primitive Cultivation
- Stock-rearing Grounds
- Hunting & Fishing Grounds
- Deserts—Sandy and Stony
- Regions of Perpetual Ice left White



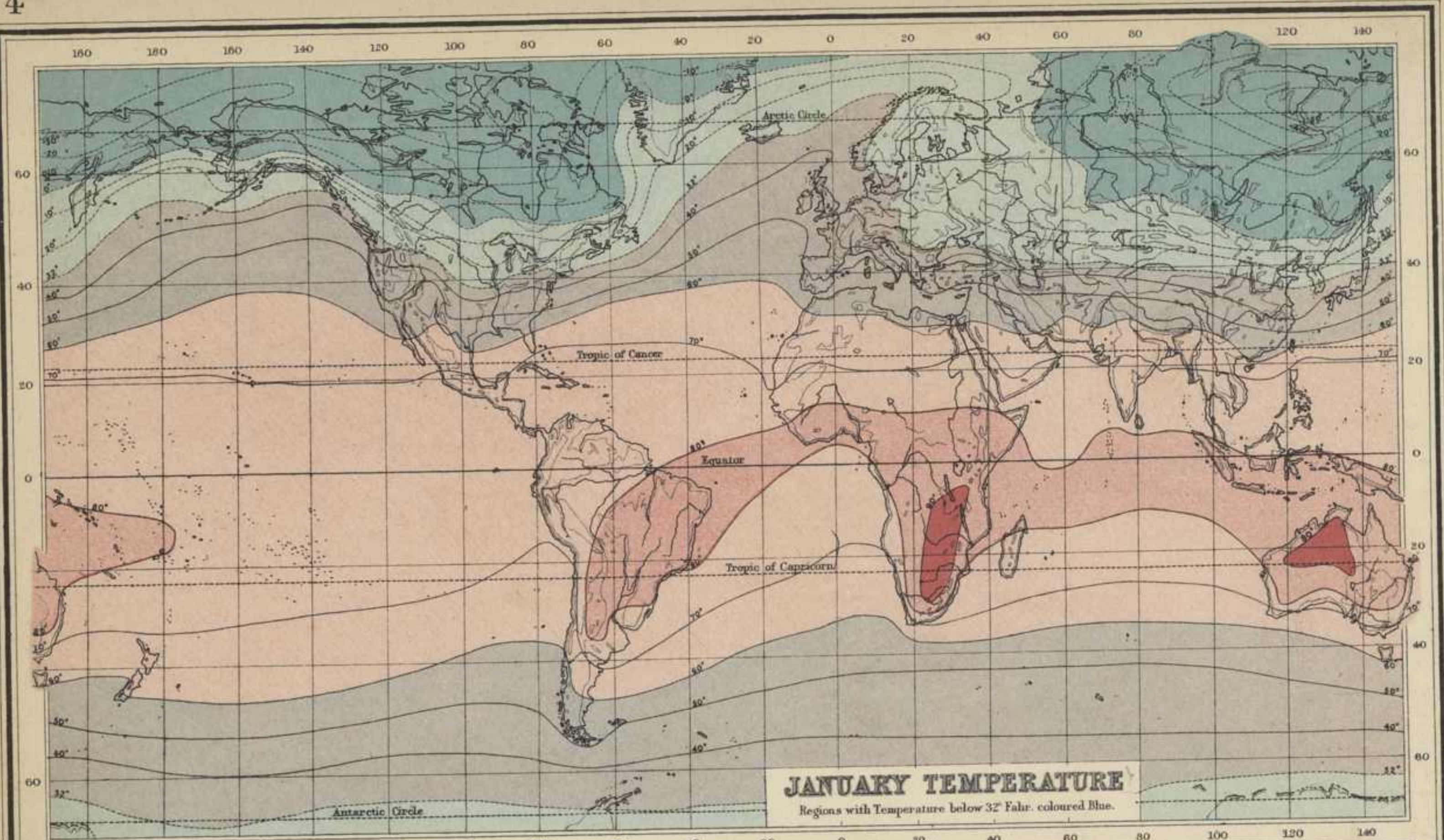
ÉCOLE LIBRE DES SCIENCES POLITIQUES BIBLIOTHÈQUE

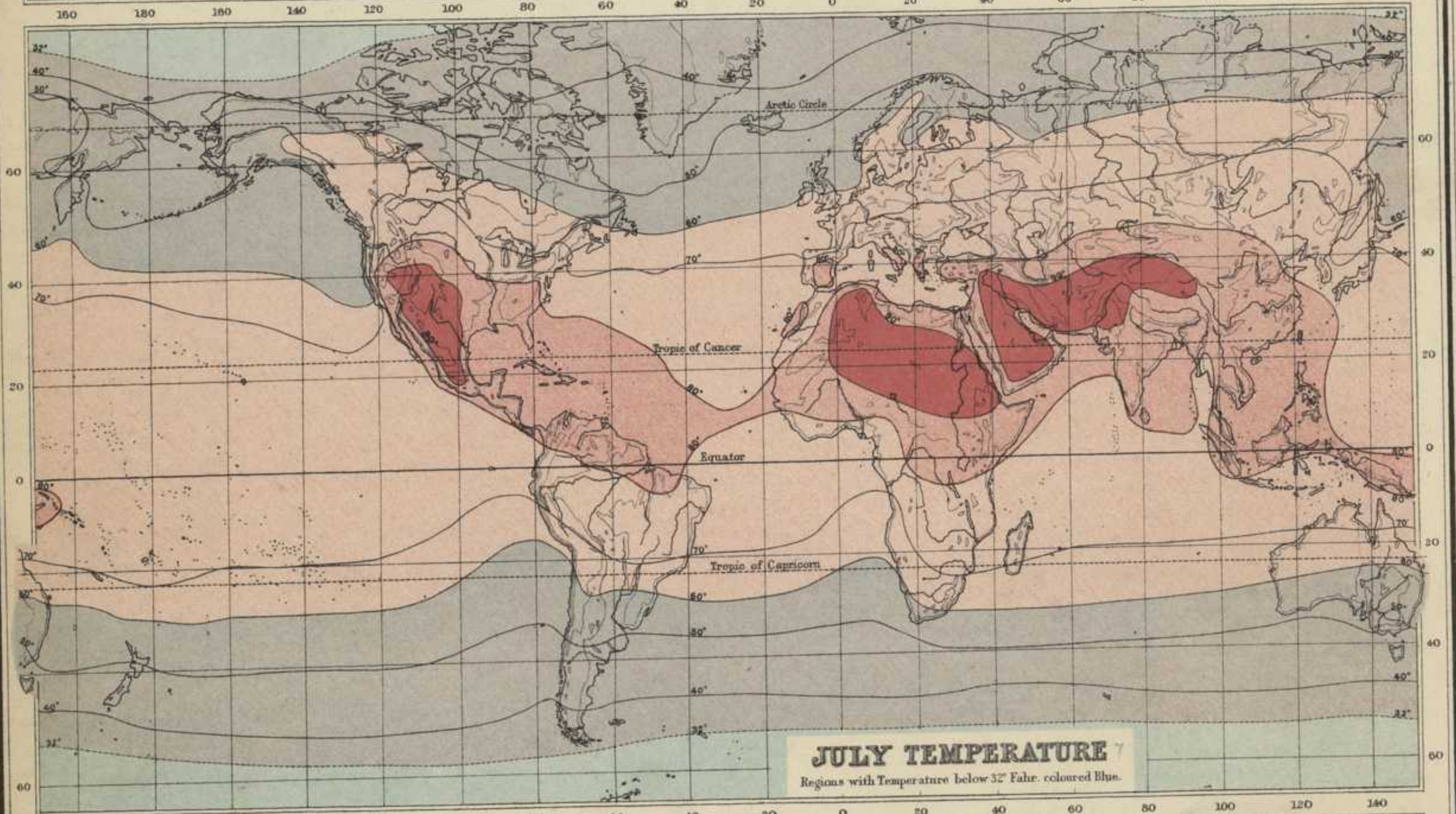


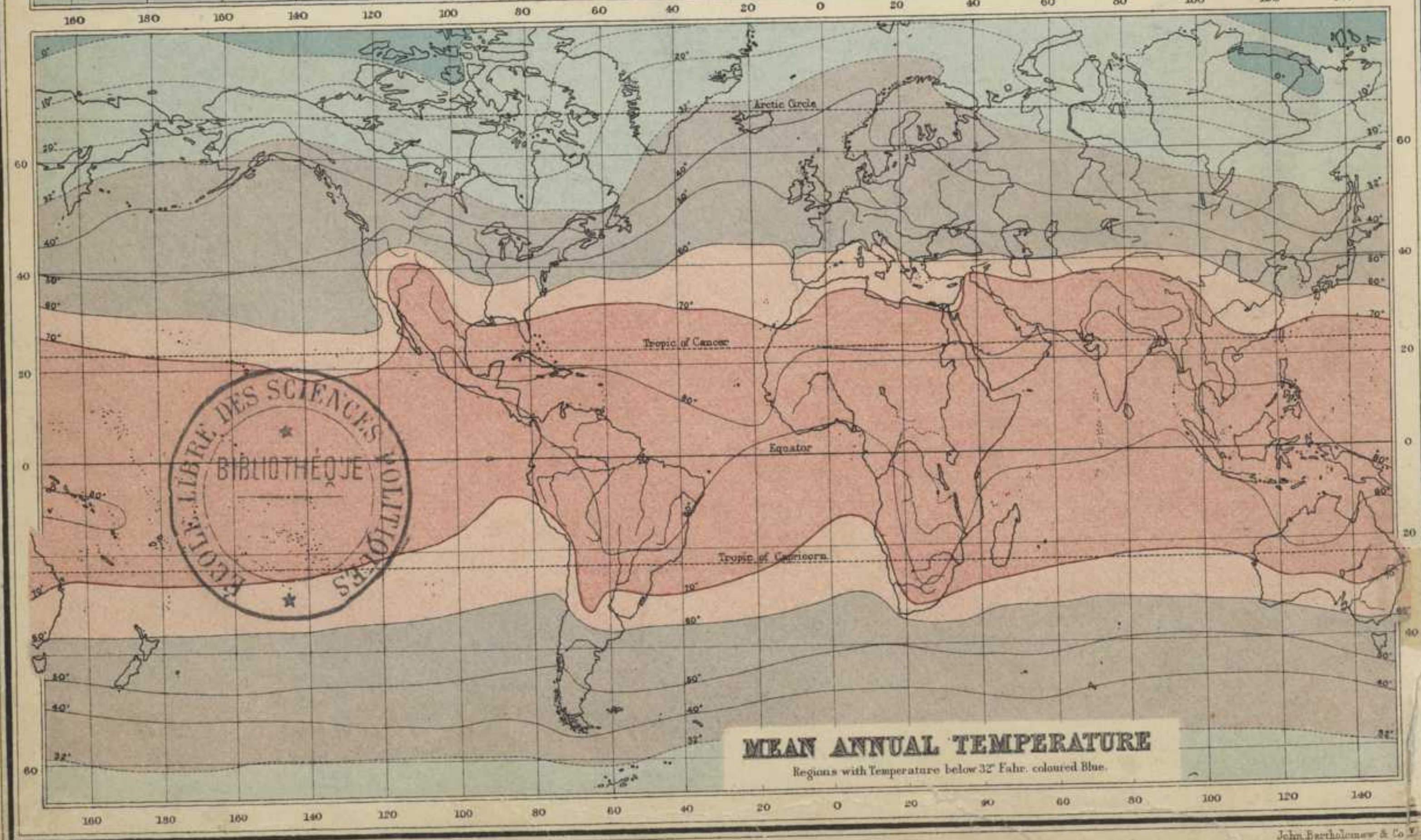

### TEMPERATURE OF OCEAN SURFACE

The lines on the ocean are the Mean Annual Isotherms of Surface Water. The figures indicate the temperature in Deg. Fahr.

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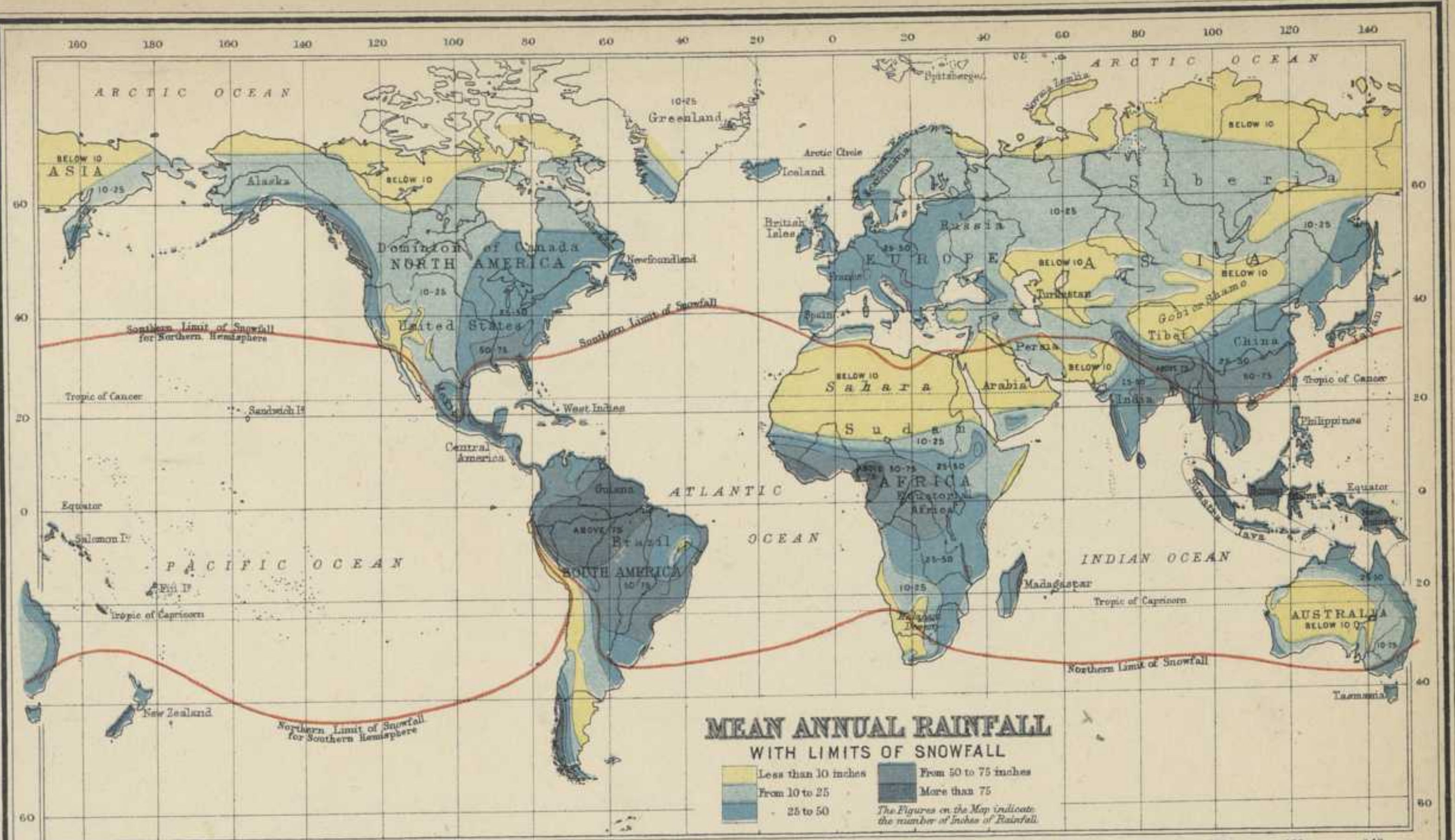


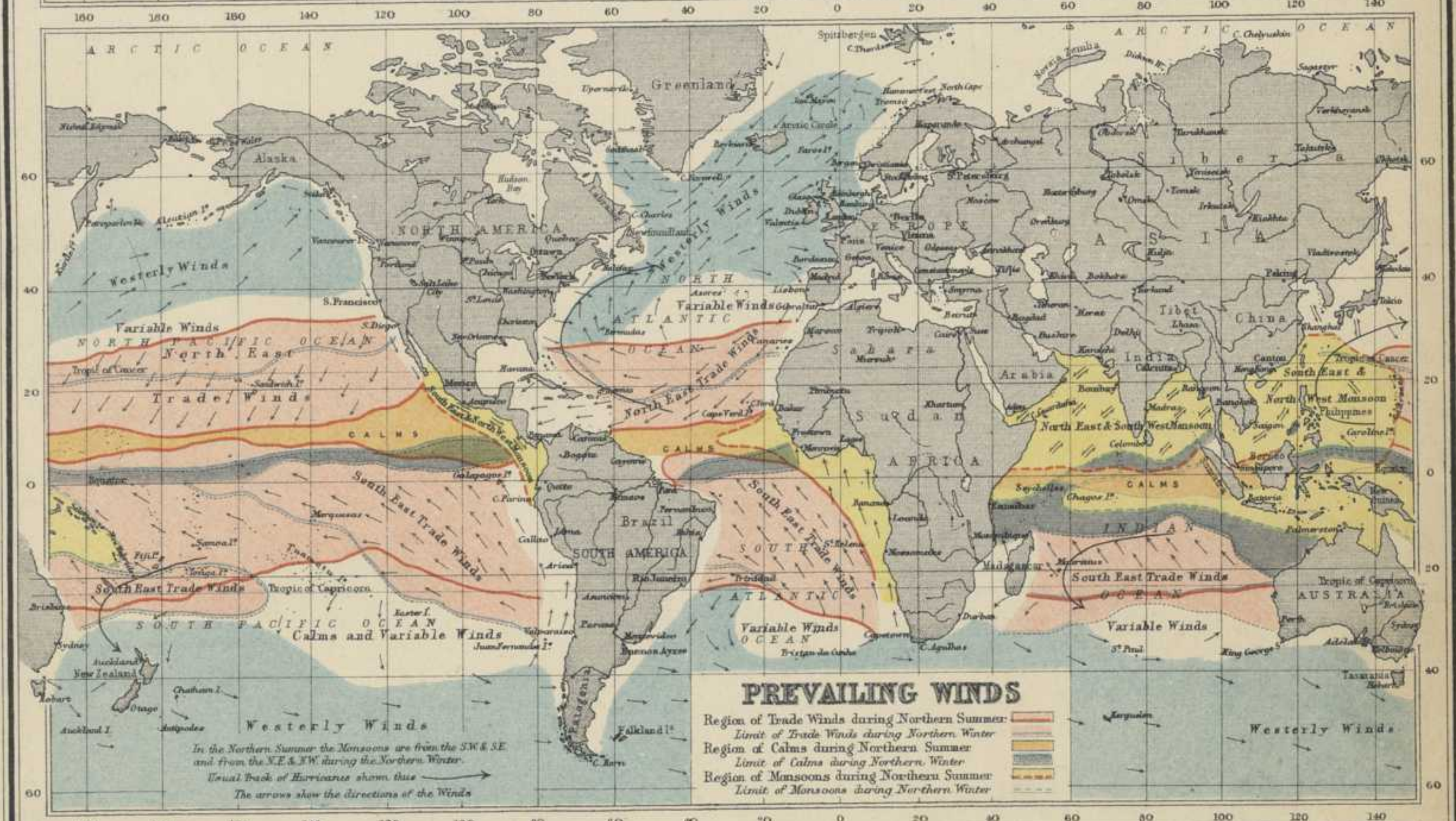



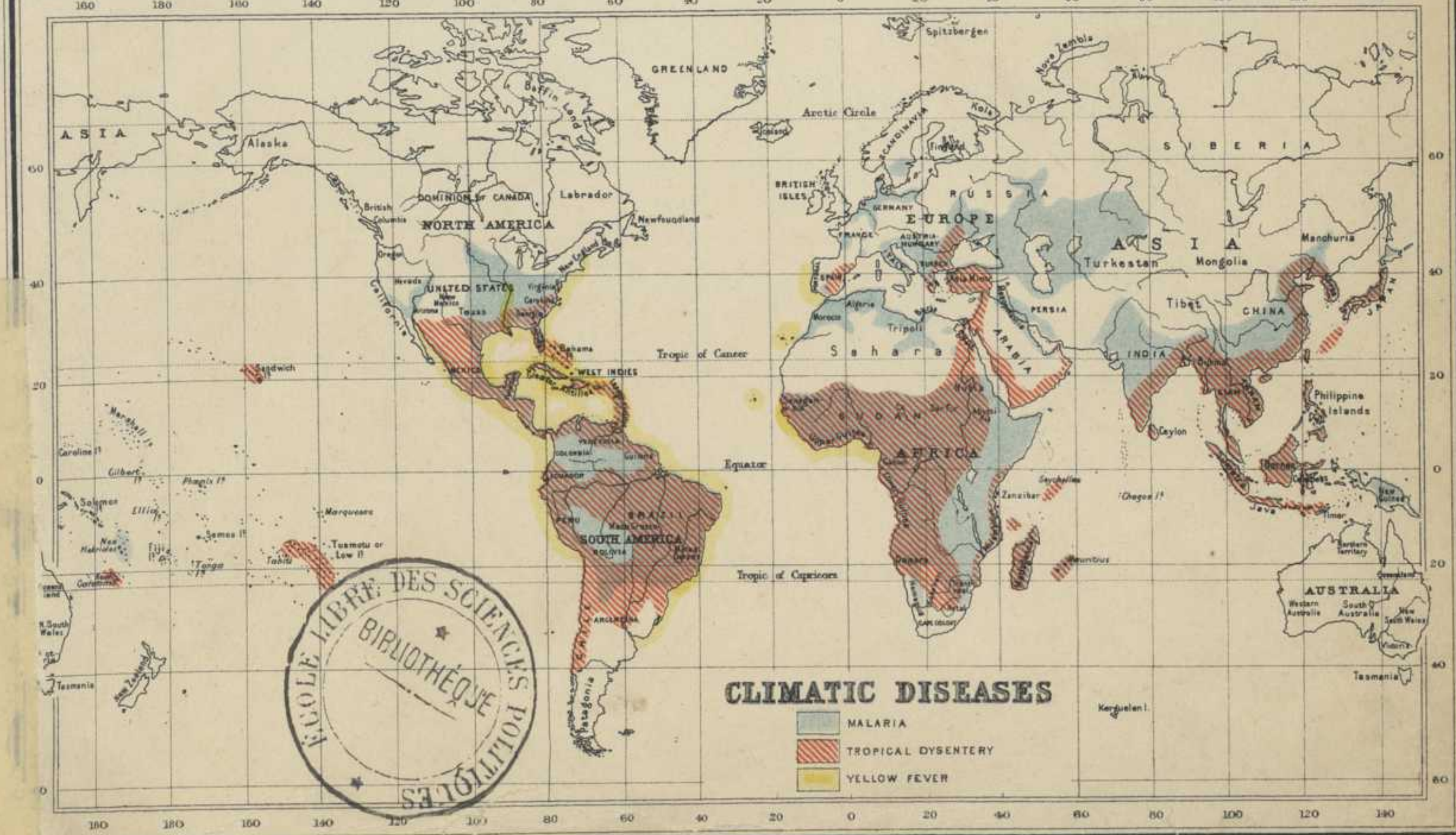






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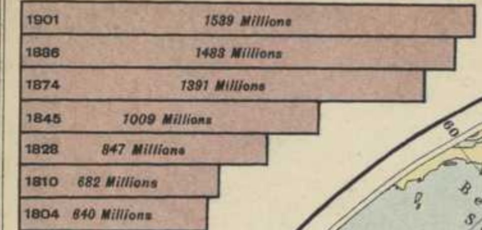




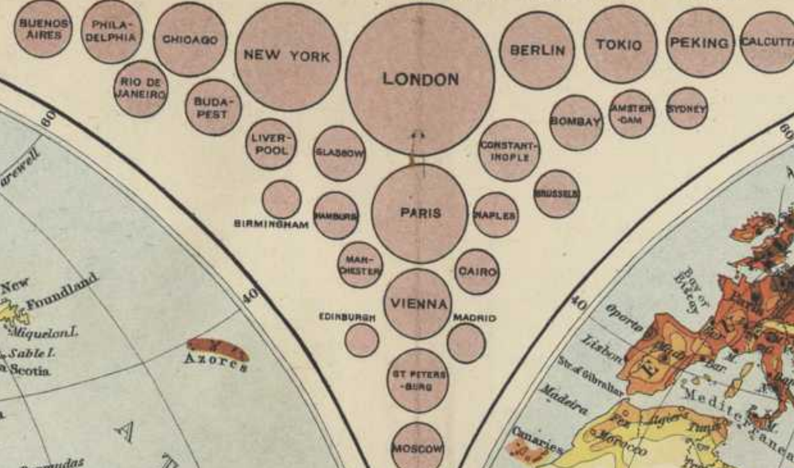
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# DENSITY OF POPULATION, 1906

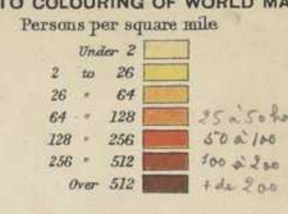





WESTERN HEMISPHERE




EASTERN HEMISPHERE









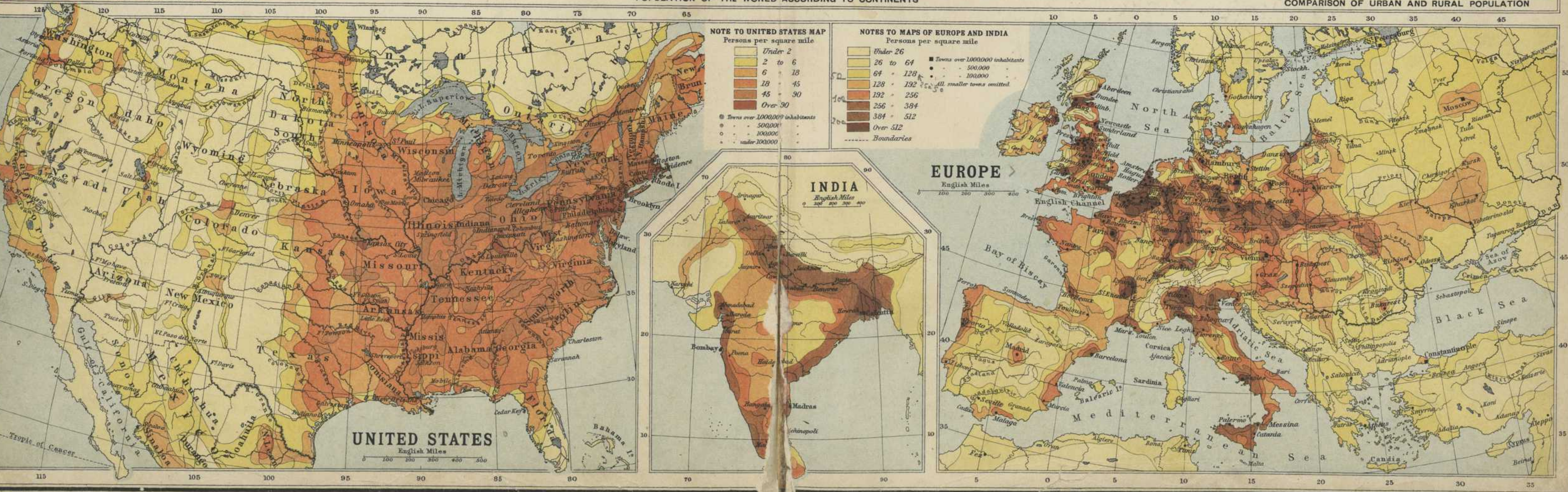


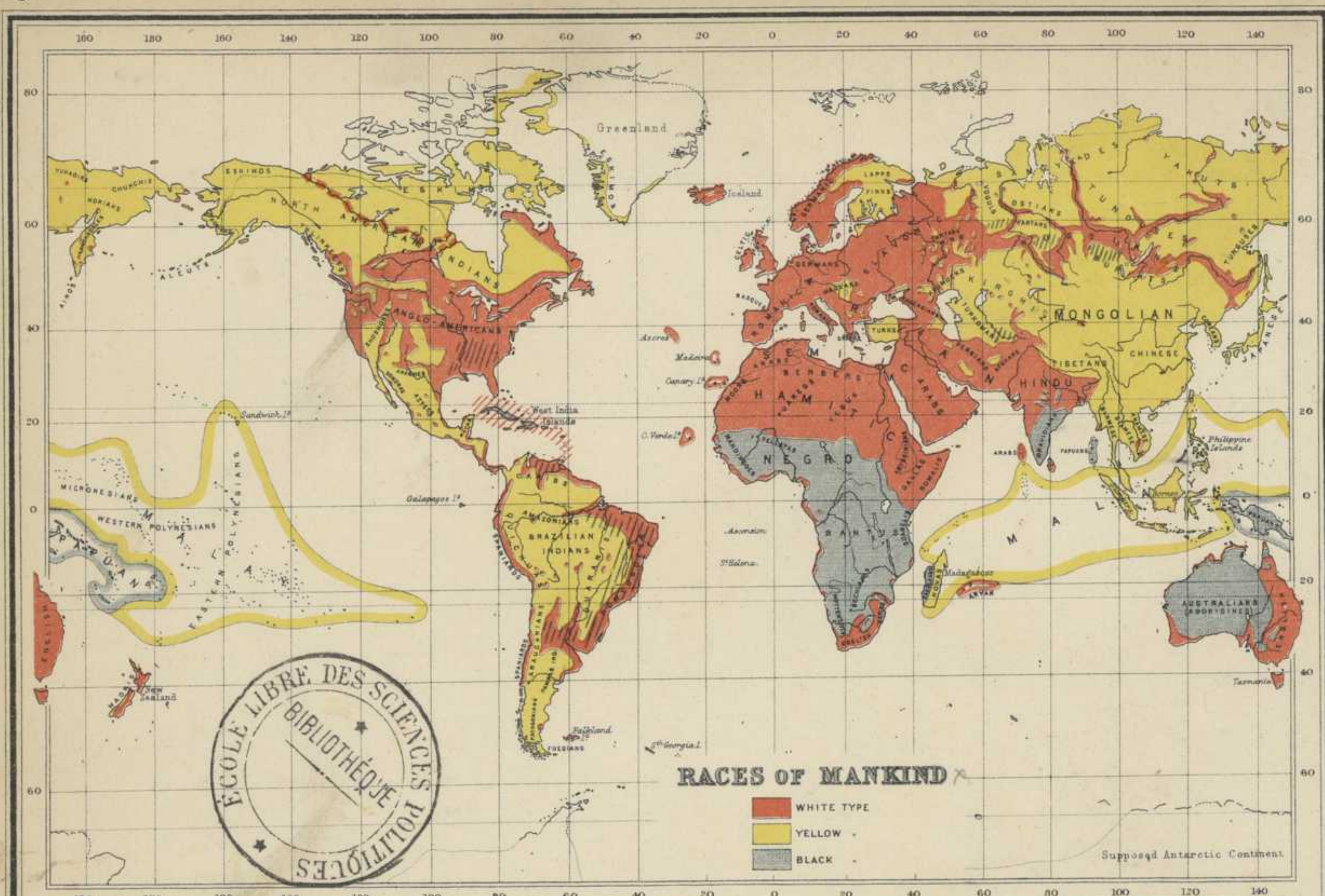
AUSTRALIA
SOUTH AMERICA
N. AMERICA 107,000,000
AFRICA 180,000,000
EUROPE, 392,000,000
ASIA, 813,500,000

POPULATION OF THE WORLD ACCORDING TO CONTINENTS

BELGIUM
SCANDINAVIA
SPAIN
ITALY
UNITED KINGDOM
Urban FRANCE Rural
AUSTRIA
Urban GERMANY Rural
Urban UNITED STATES Rural
Urban RUSSIA Rural

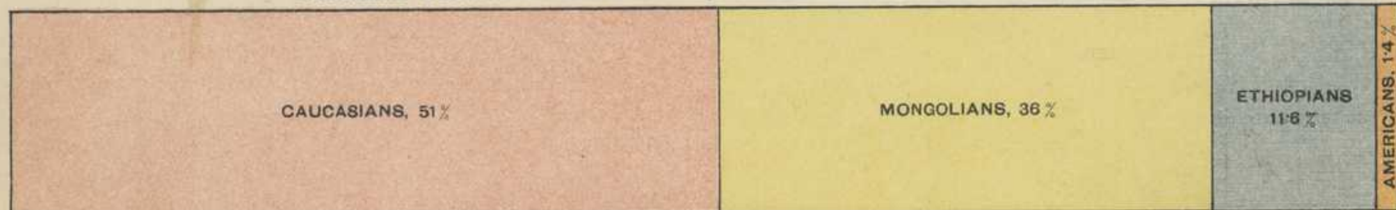
COMPARISON OF URBAN AND RURAL POPULATION

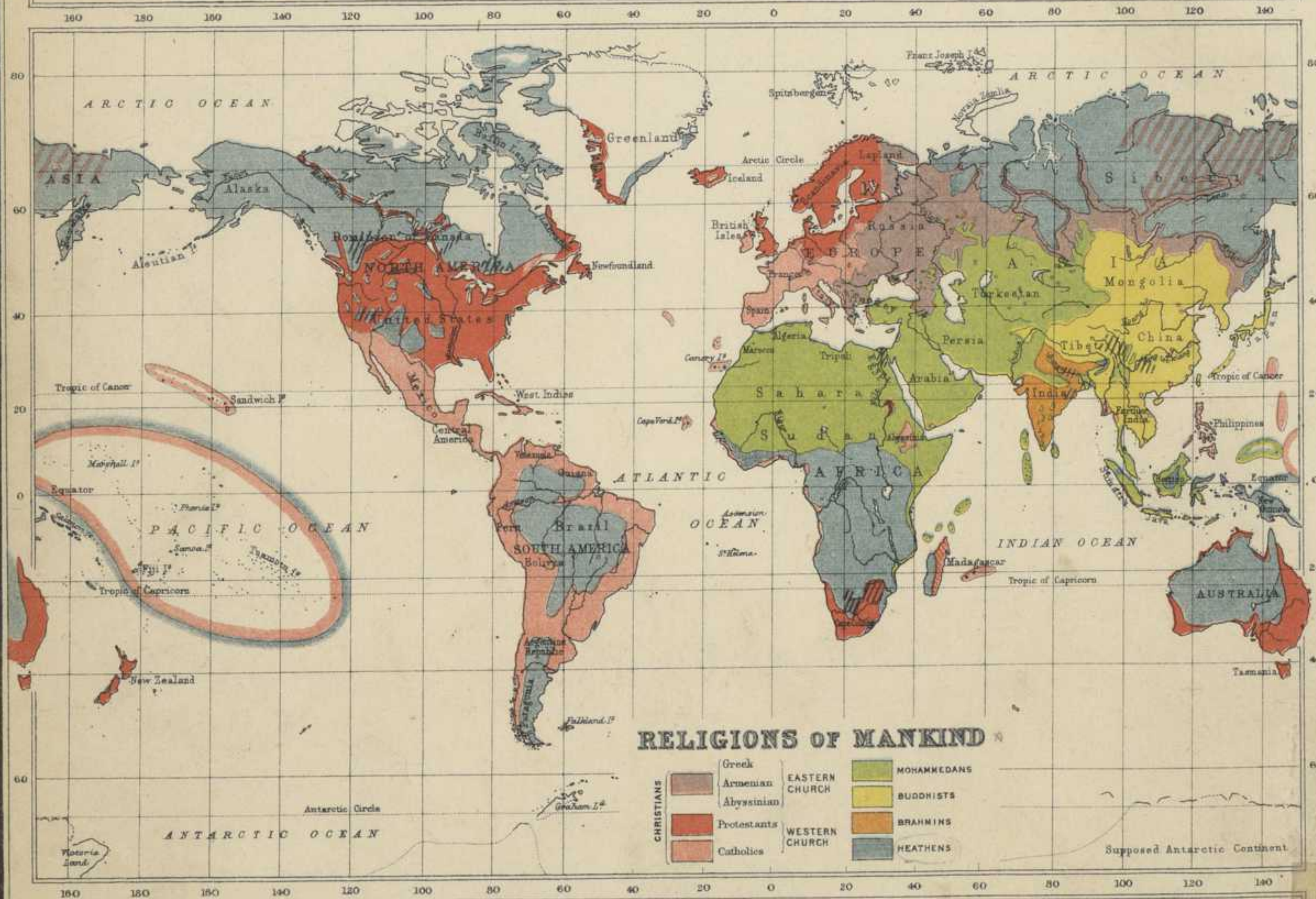




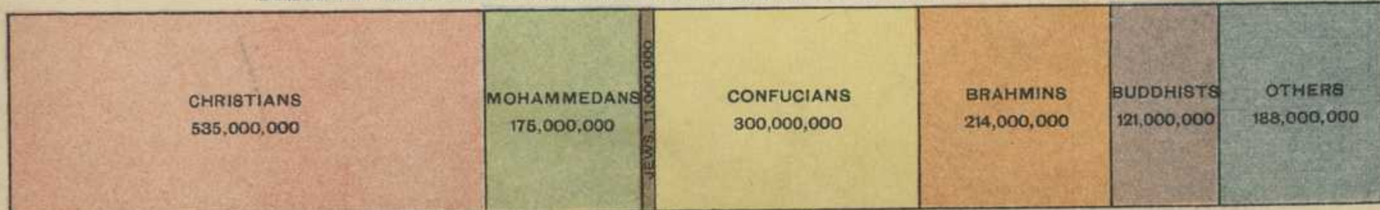



## DIAGRAM SHOWING COMPARATIVE NUMBERS OF DIFFERENT RACES



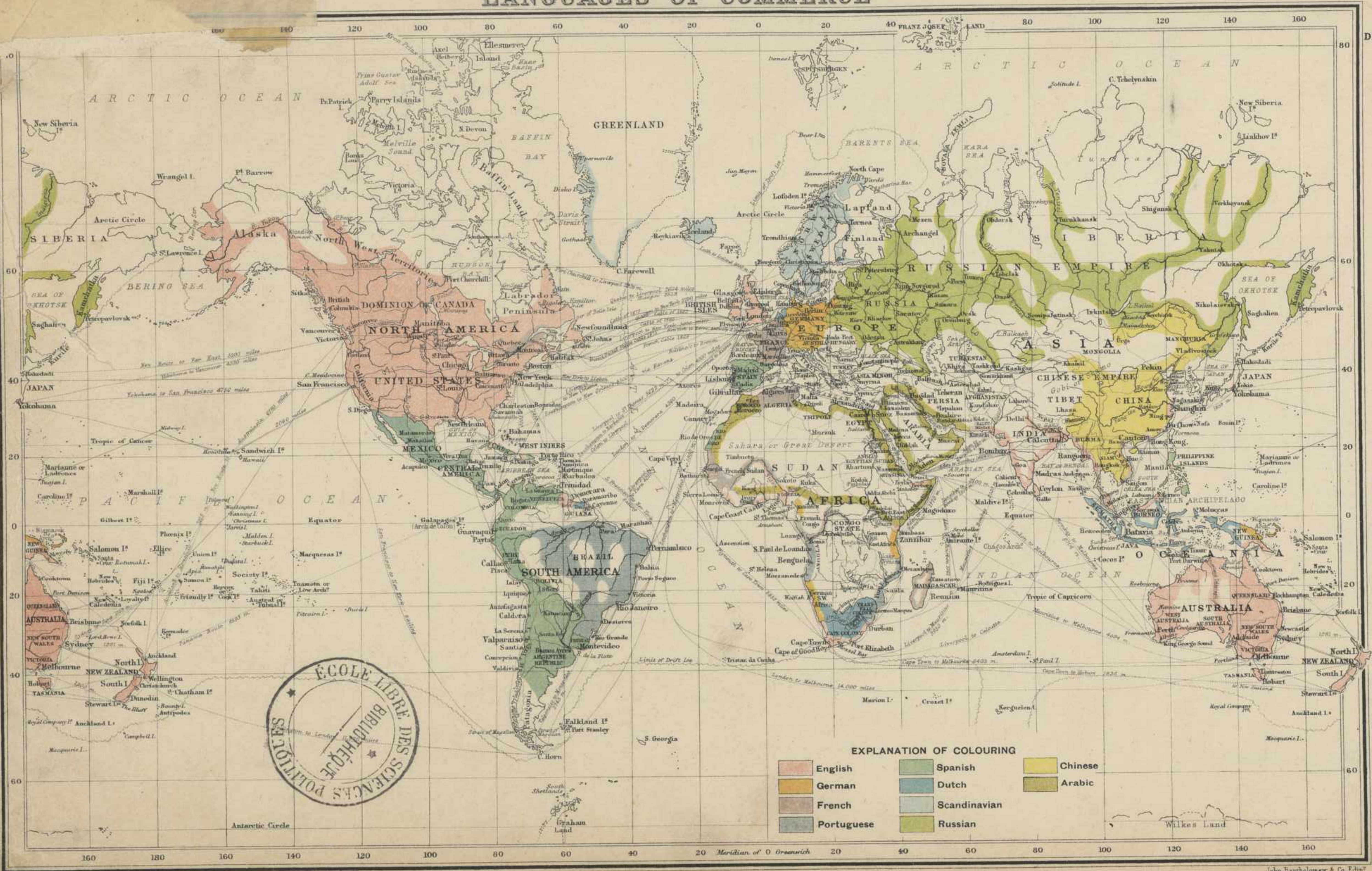




## DIAGRAM SHOWING COMPARATIVE NUMBERS OF DIFFERENT RELIGIONS




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# LANGUAGES OF COMMERCE






NUMBERS SPEAKING DIFFERENT LANGUAGES

| Language | Number |
| --- | --- |
| ENGLISH | 111,000,000 |
| GERMAN | 75,000,000 |
| RUSSIAN | 75,000,000 |
| FRENCH | 51,000,000 |
| SPANISH | 43,000,000 |
| ITALIAN | 33,000,000 |
| PORTUGUESE | 13,000,000 |

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## NATION… FLAGS USE… BY MERCANTIL… SHIPPING

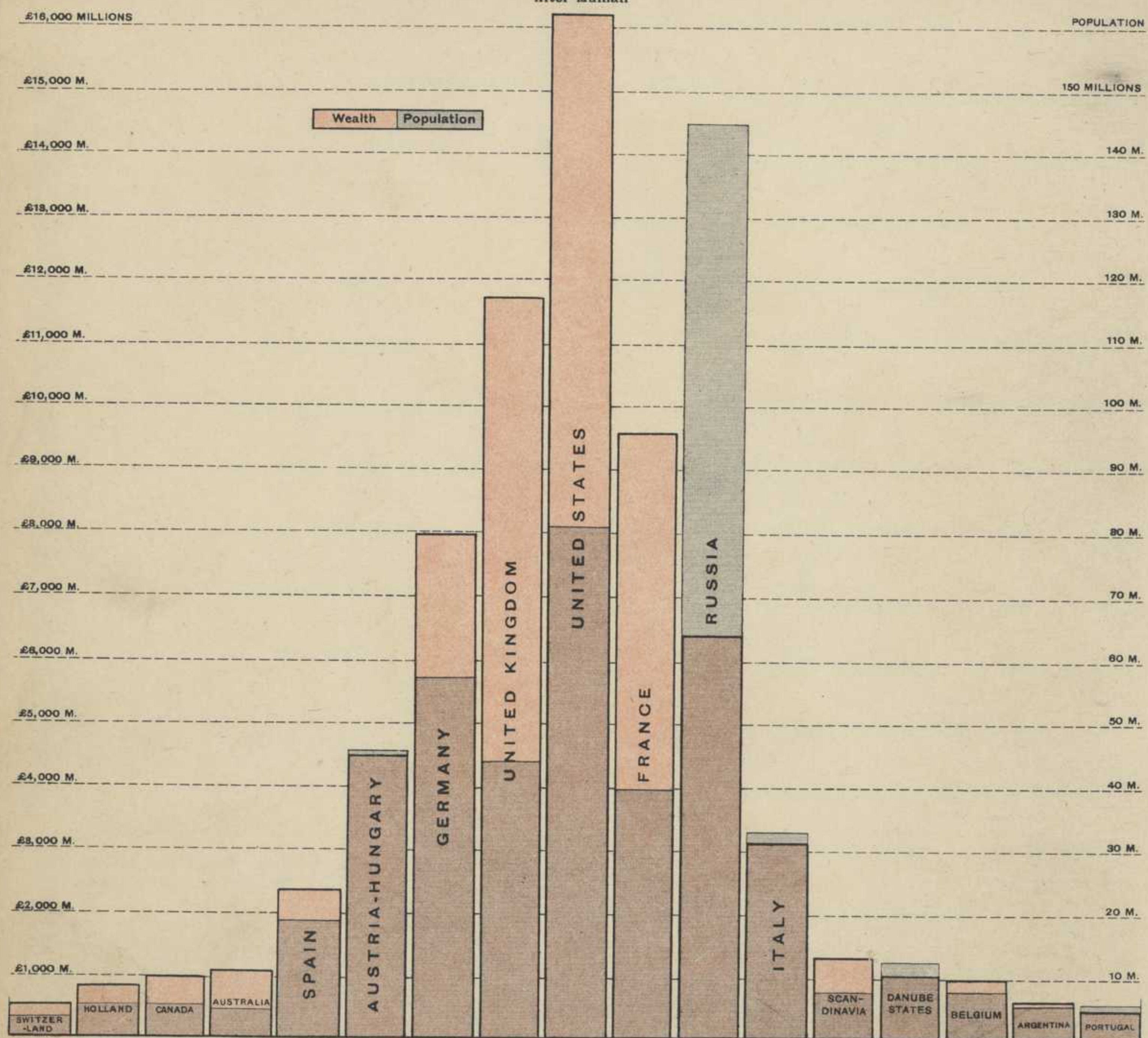
| | | | | | |
|---|---|---|---|---|---|
| RED ENSIGN MERCHANT SERVICE | FRANCE MERCHANT SERVICE | HOLLAND OR NETHERLANDS MERCHANT SERVICE | BELGIUM MERCHANT SERVICE | GERMANY MERCHANT SERVICE | AUSTRIA MERCHANT SERVICE |
| DENMARK MERCHANT SERVICE | SWEDEN MERCHANT SERVICE | NORWAY MERCHANT SERVICE | RUSSIA MERCHANT SERVICE | SPAIN MERCHANT SERVICE | PORTUGAL MERCHANT SERVICE |
| ITALY MERCHANT SERVICE | GREECE MERCHANT SERVICE | TURKEY MERCHANT SERVICE | CHINA MERCHANT SERVICE | JAPAN MERCHANT SERVICE | UNITED STATES MERCHANT SERVICE |
| MEXICO MERCHANT SE… | COLOMBIA …HANT SERVICE | VENEZUELA MERCHANT SERVICE | BRAZ… …ERCHANT …RVICE | CHILE MERCHANT SERVICE | ARGENTINE REPUBLIC MERCHANT SERVICE |
| URUGUAY MERCHANT SERVICE | PERU MERCHANT SERVICE | | | | |

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# WEALTH & POPULATION OF WORLD

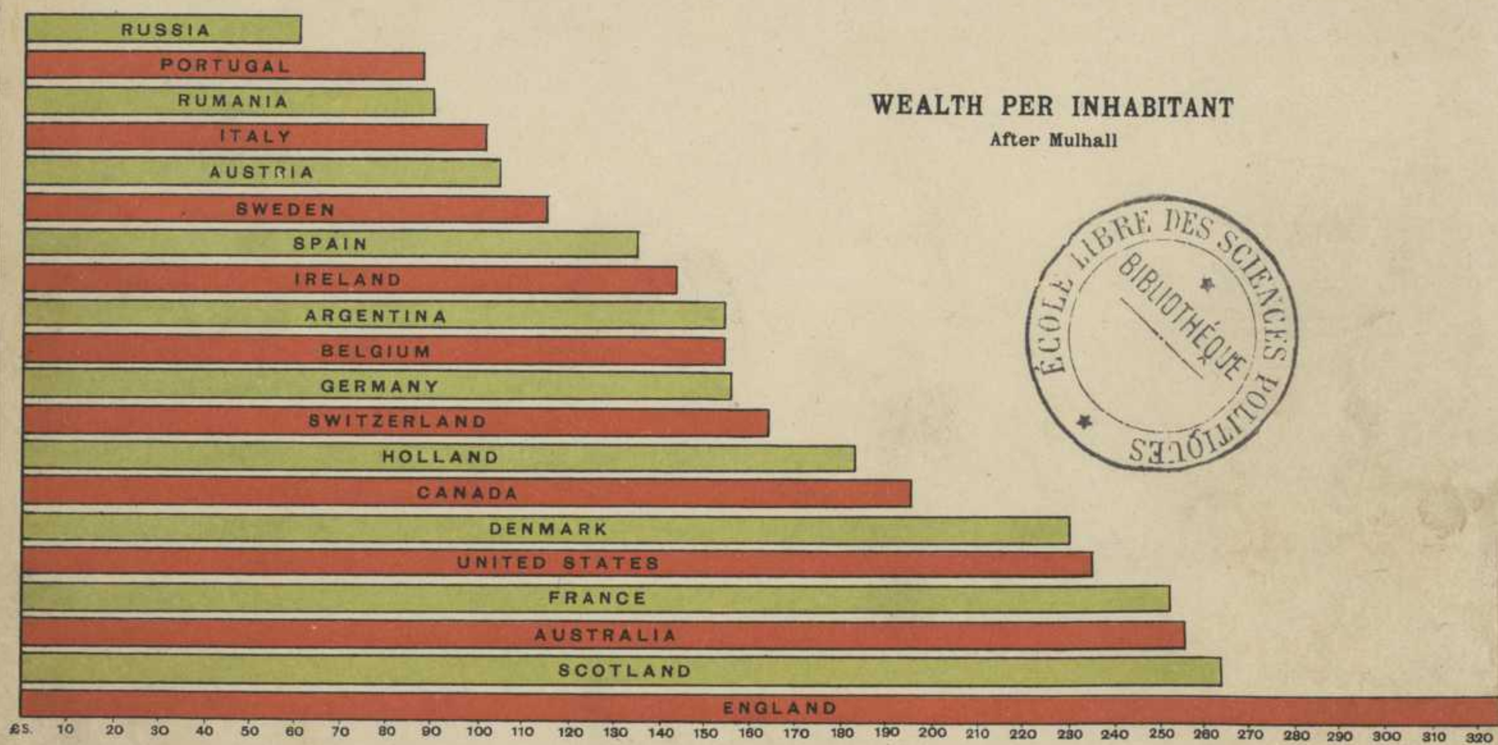
## COMPARATIVE WEALTH AND POPULATION OF DIFFERENT NATIONS.

After Mulhall




## WEALTH PER INHABITANT

After Mulhall

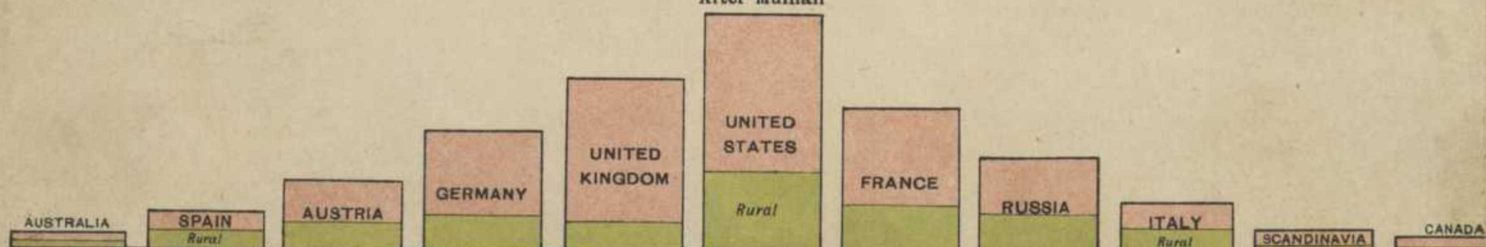






## RURAL AND NON-RURAL WEALTH OF NATIONS

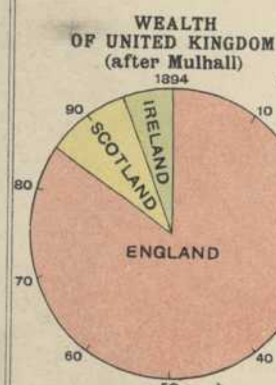
After Mulhall

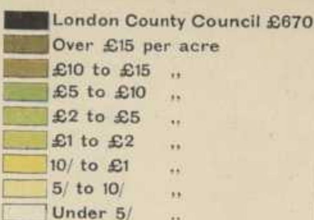



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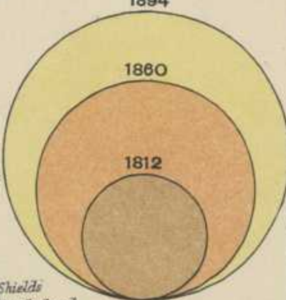
## COMPARATIVE VALUATION OF LANDS ACCORDING TO RENTAL, 1904

### WEALTH OF UNITED KINGDOM (after Mulhall) 1894



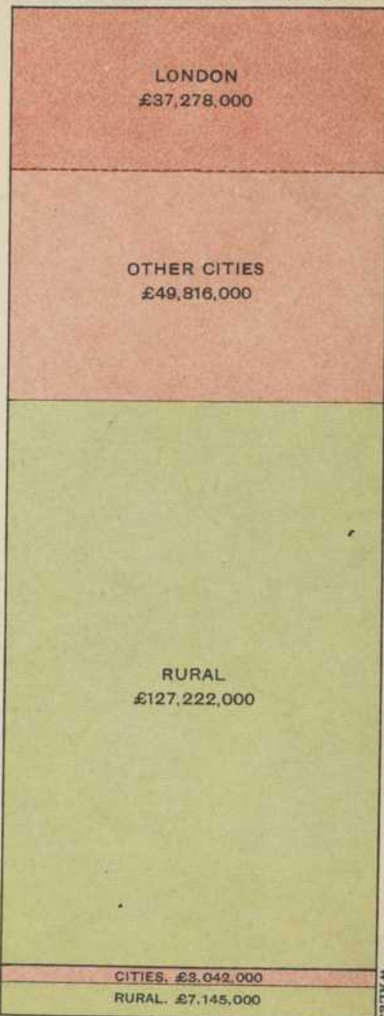

### GROWTH OF UNITED KINGDOM'S WEALTH (after Mulhall) 1894



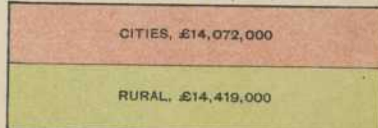




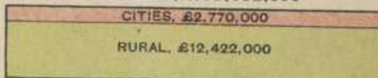
### TOTAL VALUATION ENGLAND & WALES. £224,503,000



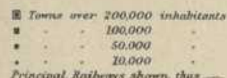

### SCOTLAND. £28,491,000

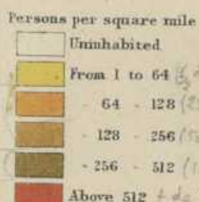



### IRELAND. £15,192,000

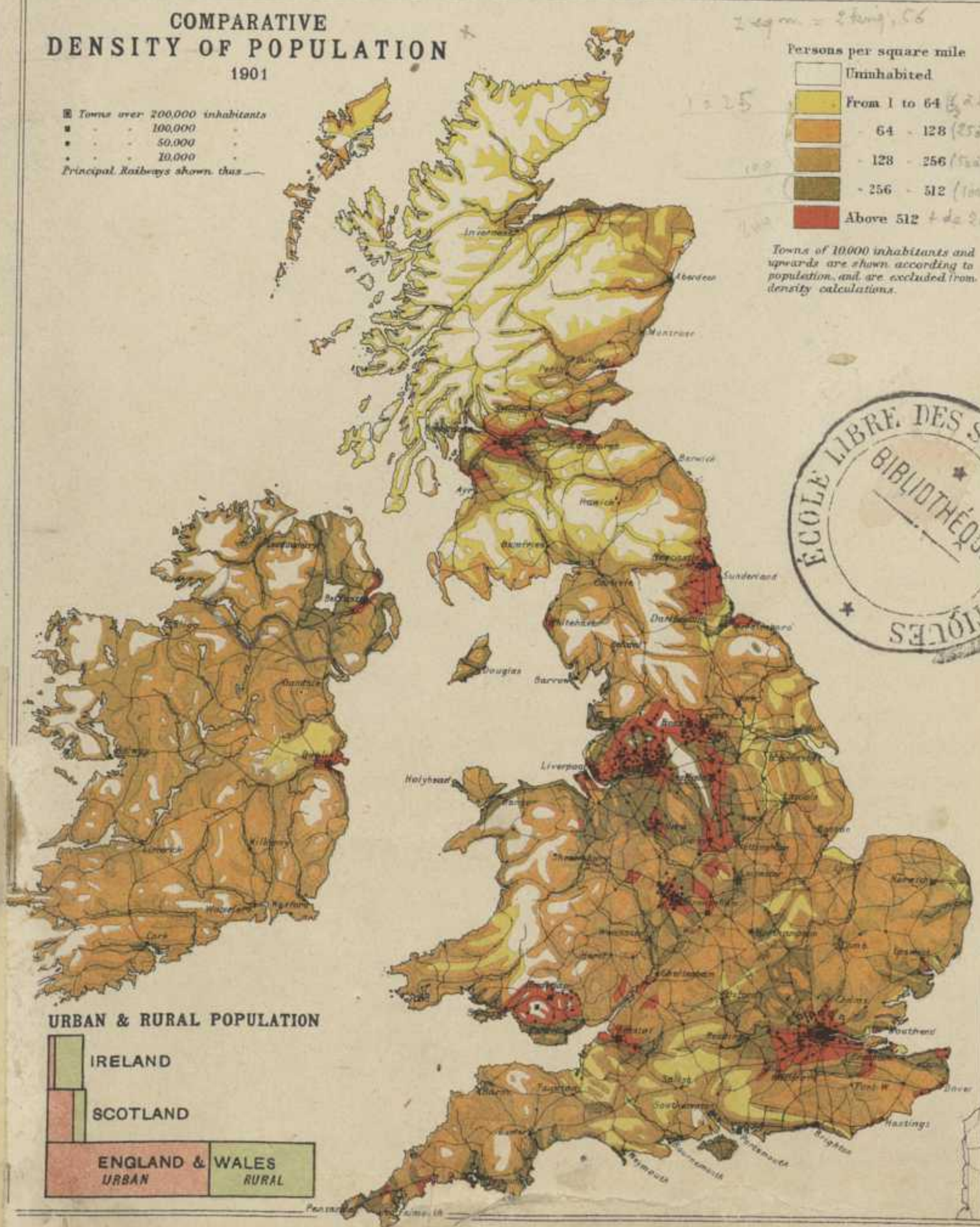



## COMPARATIVE DENSITY OF POPULATION 1901



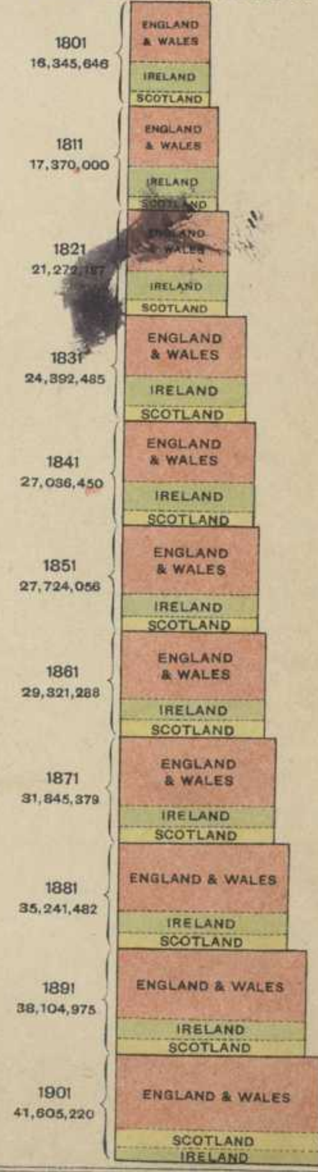

*Towns of 10,000 inhabitants and upwards are shown according to population, and are excluded from density calculations.*




### URBAN & RURAL POPULATION




### GROWTH OF POPULATION IN THE UNITED KINGDOM, 1801-1901






John Bartholomew & Co. Edin.

# STATES AND BRITISH REPRESENTATION



**COLOURING OF STATES**

- British Empire
- United States
- French Possessions
- German Empire
- Russian ,,
- Japanese ,,

*Other Independent States are coloured in lighter tints*
*See also Plate 16*

**BRITISH REPRESENTATION**
**OFFICIAL AND COMMERCIAL**

- British Embassy shown thus — ST PETERSBURG
- British Legation ,, — PEKING
- British Consulate-General or Consulate — Riga
- British Vice-Consulate or Consular Agent — Lisbon

*In Foreign States no Towns are shown unless they have British Representatives*
*American Continuation on Plate 16*

SIBERIA · RUSSIA · EUROPE · ASIA · CHINESE EMPIRE · AFRICA · AUSTRALIA · ATLANTIC OCEAN · INDIAN OCEAN · PACIFIC OCEAN







## COMPARATIVE TOTAL TR[ADE OF D]IFFERENT COUNTRIES, 1906

IMPORTS | EXPORTS

| Country | Total Trade |
|---|---|
| Greece | |
| Portugal | |
| Algeria | |
| Norway | |
| Turkey | |
| Sweden | 54,240,000 |
| Spain | £74,257,000 |
| Switzerland | £91,089,000 |
| British South Africa | £99,158,000 |
| Russia | £165,909,000 |
| Austria-Hungary | £180,249,000 |
| Holland | £367,000,000 |
| Germany | £615,772,000 |
| United Kingdom | [illegible]3,101,000 |
| France | £458,640,000 |
| Belgium | £202,064,000 |
| British India | £168,194,000 |
| Italy | £151,430,000 |
| China | £128,154,000 |
| Straits Settlements | £121,842,000 |
| Australia | £94,510,000 |
| Japan | £82,275,000 |
| Denmark | £60,948,000 |
| Egypt | 43,016,000 |
| New Zealand | |
| Persia | |

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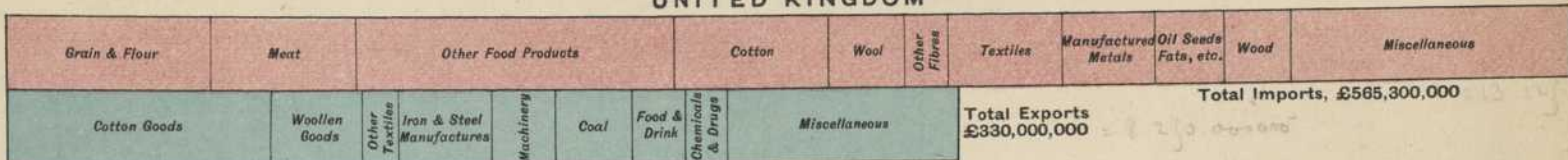


NORTH AMERICA
SOUTH AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
GREENLAND
BAFFIN LAND
Arctic Circle
Hudson Bay
ALASKA
YUKON
MACKENZIE
ATHABASCA
BRITISH COLUMBIA
DOMINION OF CANADA
UNGAVA
LABRADOR
NEWFOUNDLAND
NOVA SCOTIA
UNITED STATES
WASHINGTON
MEXICO
WEST INDIES
CUBA
Jamaica
Tropic of Cancer
HAWAIIAN Is
Equator
VENEZUELA
COLOMBIA
ECUADOR
PERU
BRAZIL
BOLIVIA
ARGENTINE REPUBLIC
Tropic of Capricorn
Falkland Is
Sth Georgia
COLOURING OF STATES
British Empire
United States
French Possessions
Other independent States are coloured in lighter tints
BRITISH REPRESENTATION
OFFICIAL AND COMMERCIAL
British Embassy shown thus WASHINGTON
British Legation MEXICO
British Consulate-General or Consulate Savannah
British Vice-Consulate or Consular Agent Wilmington
In Foreign States no Towns are shown unless they have British Representatives
COMPARATIVE TOTAL TRADE OF DIFFERENT COUNTRIES, 1906
IMPORTS
EXPORTS
UNITED STATES £578,866,000
ARGENTINA £105,800,000
CANADA £97,000,000
BRAZIL £81,000,000
CUBA £51,240,000
MEXICO
CHILE £35 MIL
URU-GUAY
BRIT. WEST INDIES
NEWFOUNDL
Longitude West 90 of Greenwich
John Bartholomew &

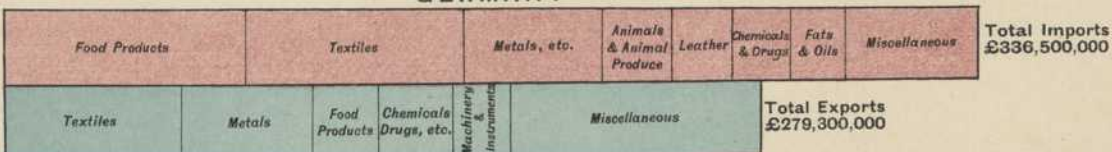
# COMPARATIVE IMPORTS & EXPORTS
### OF VARIOUS COUNTRIES DRAWN TO SAME SCALE

## EUROPE

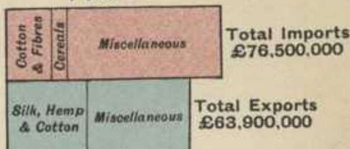
### UNITED KINGDOM



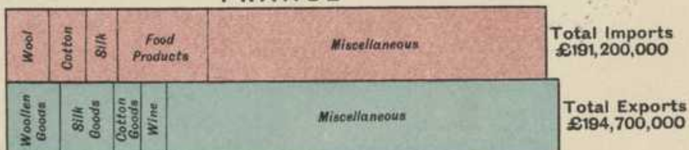

### GERMANY



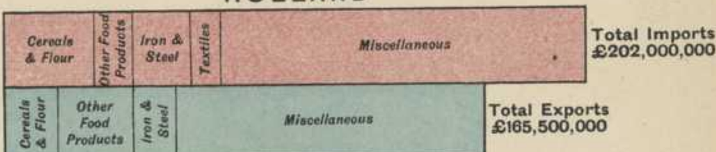

### ITALY




### FRANCE



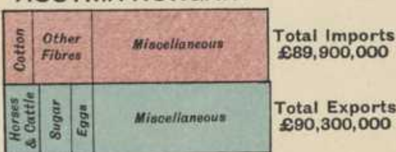

### HOLLAND



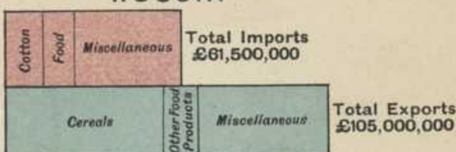

### BELGIUM




### AUSTRIA-HUNGARY



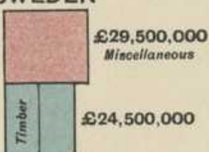

### RUSSIA



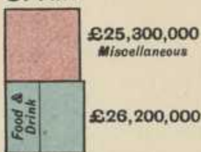

### SWITZERLAND



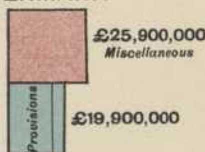

### SWEDEN




### SPAIN




### DENMARK







### TURKEY




### NORWAY




### PORTUGAL

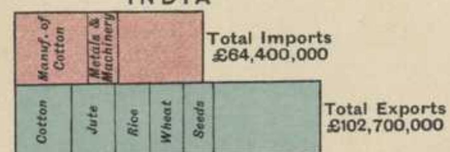



### GREECE

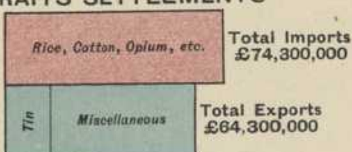



## ASIA

### INDIA



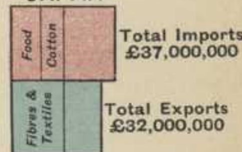

### STRAITS SETTLEMENTS




### CHINA

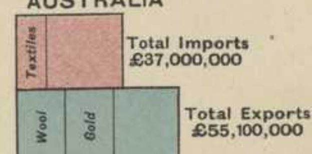



### JAPAN




## AUSTRALASIA

### AUSTRALIA

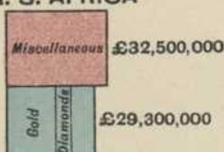



### N. ZEALAND




## AFRICA

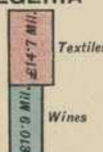
### BR. S. AFRICA




### EGYPT




### ALGERIA

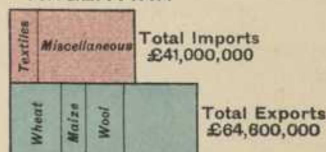



## AMERICA

### UNITED STATES



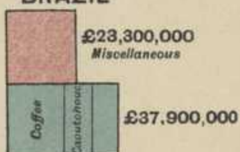

### ARGENTINA



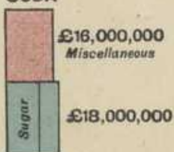

### CANADA



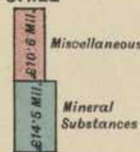

### BRAZIL




### CUBA



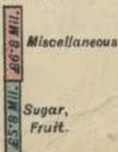

### CHILE




### URUGUAY



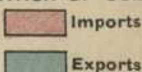

### BR. W. INDIES

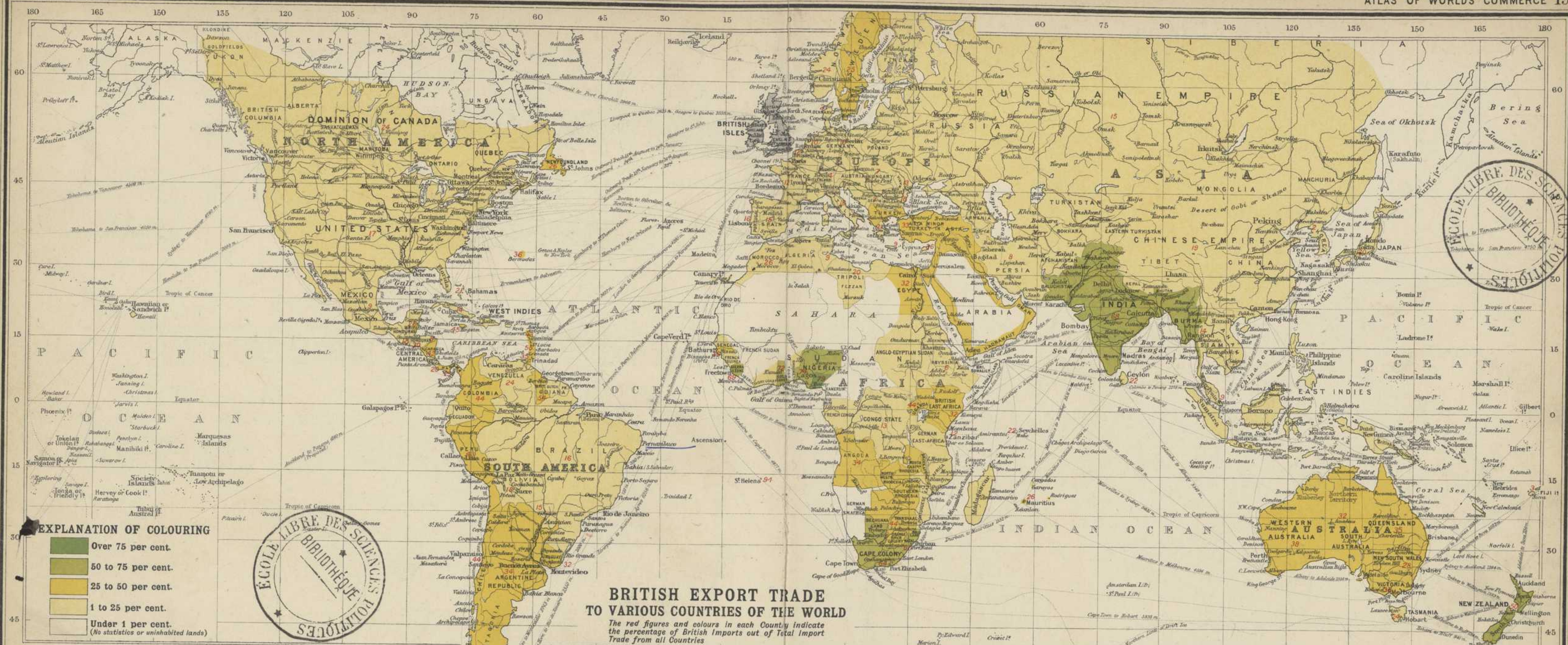



### NEWFOUNDLAND

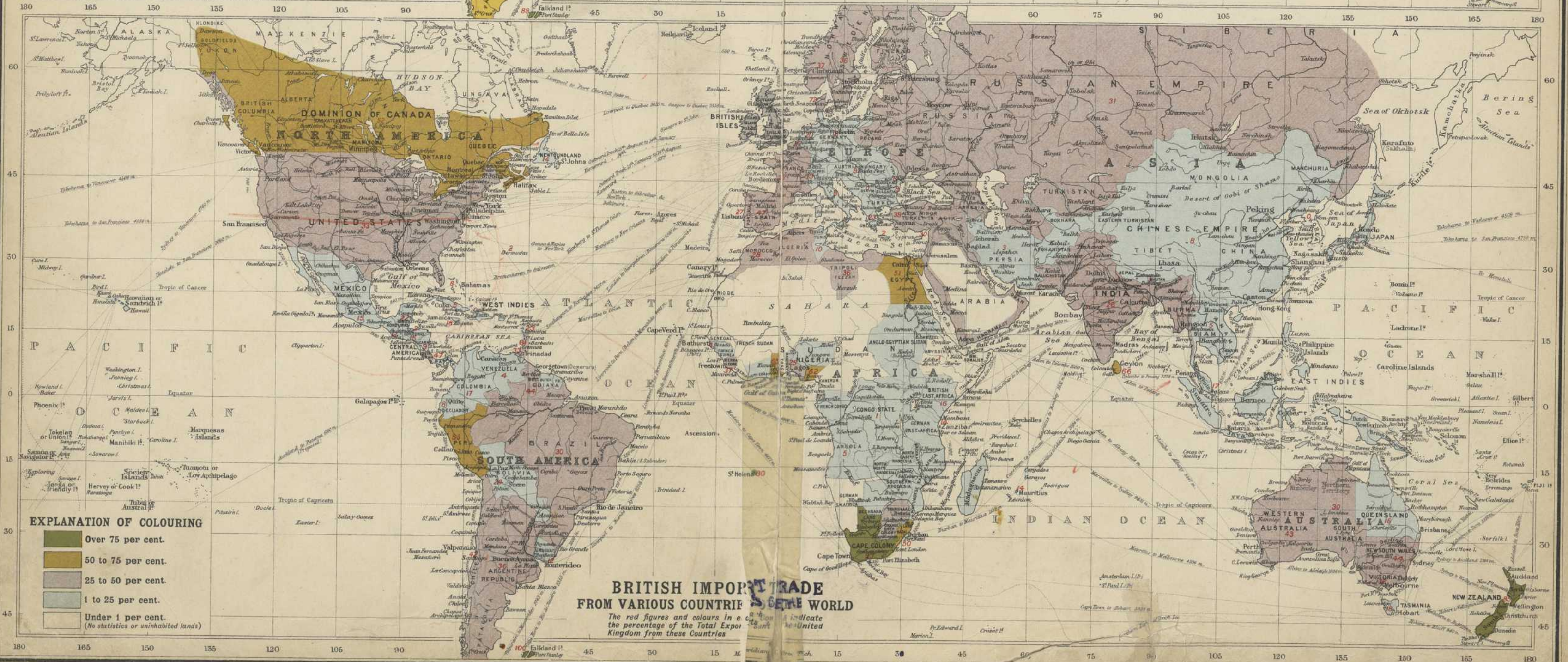



EXPLANATION OF COLOURING







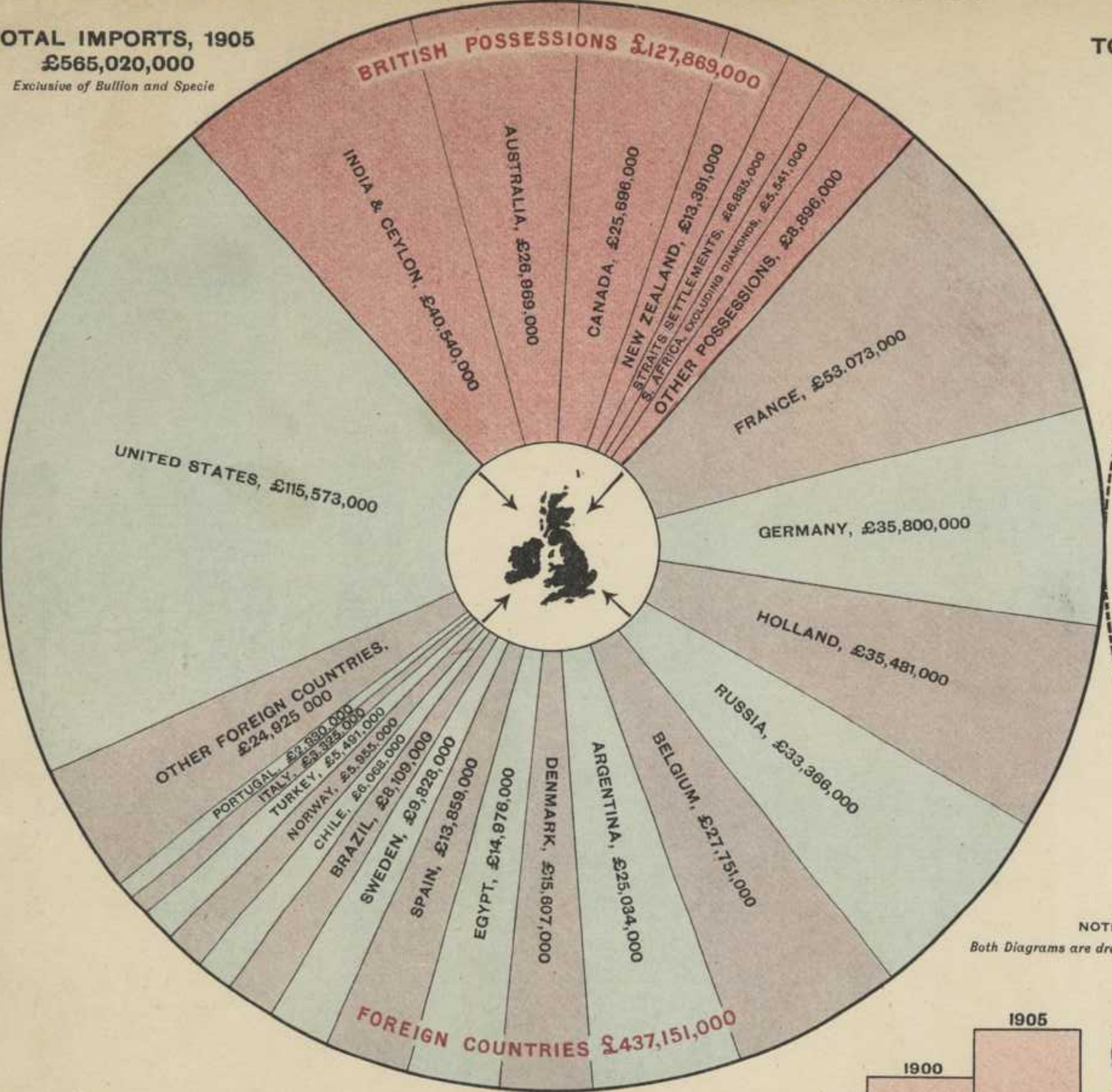




John Bartholomew & Co. Edin.

# ASPECTS OF BRITISH TRADE

## IMPORTS INTO THE UNITED KINGDOM FROM OTHER COUNTRIES

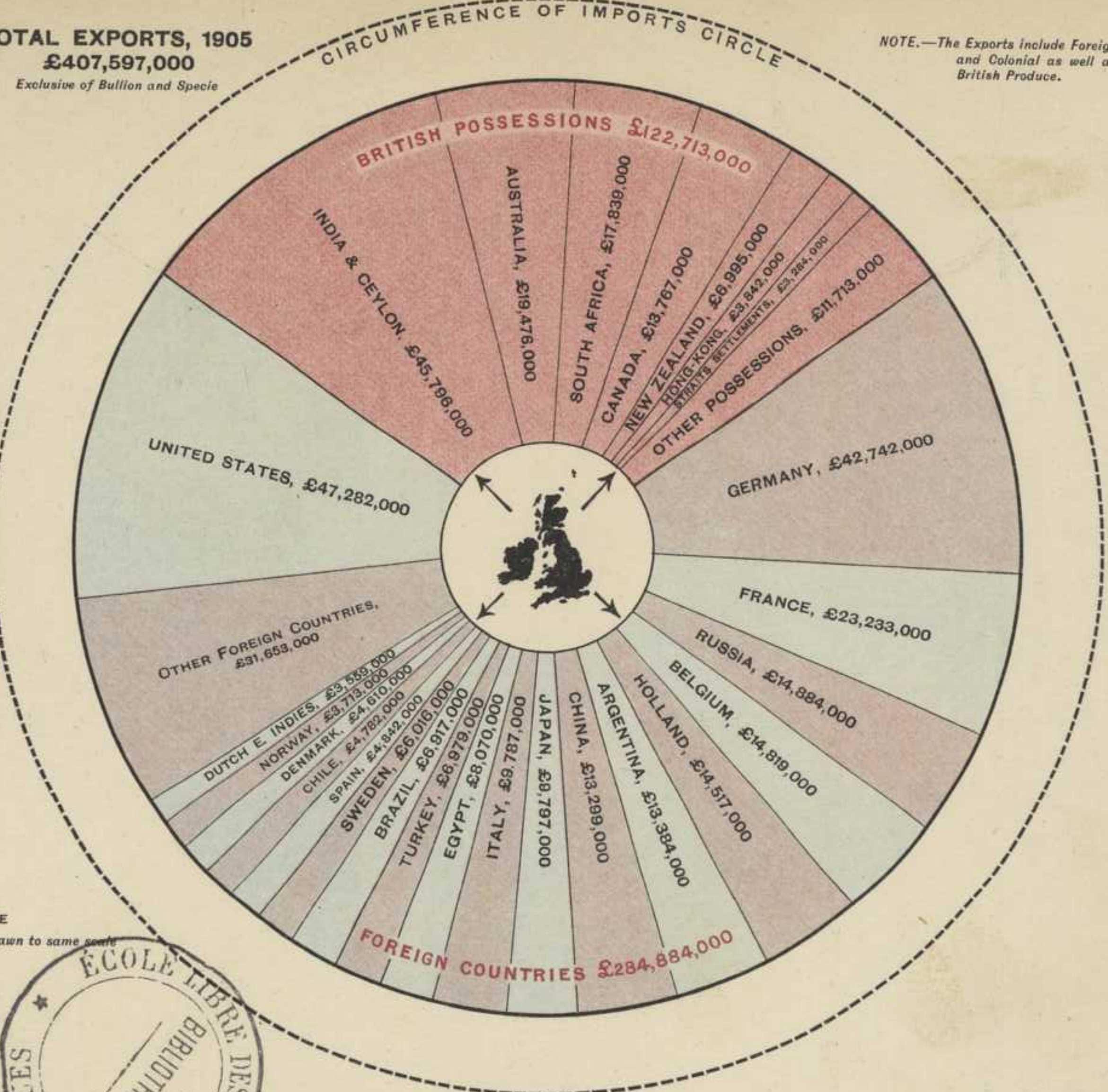
**TOTAL IMPORTS, 1905**
**£565,020,000**
*Exclusive of Bullion and Specie*




## EXPORTS FROM THE UNITED KINGDOM TO OTHER COUNTRIES

**TOTAL EXPORTS, 1905**
**£407,597,000**
*Exclusive of Bullion and Specie*

*NOTE.—The Exports include Foreign and Colonial as well as British Produce.*




NOTE
*Both Diagrams are drawn to same scale*




| | 1860 | 1865 | 1870 | 1875 | 1880 | 1885 | 1890 | 1895 | 1900 | 1905 |
|---|---|---|---|---|---|---|---|---|---|---|
| Other Countries | £167,571,000 | £198,231,000 | £238,425,000 | £289,516,000 | £318,711,000 | £286,566,000 | £324,531,000 | £321,159,000 | £413,545,000 | £437,151,000 |
| British Possessions | £42,959,000 | £72,841,000 | £64,832,000 | £84,424,000 | £92,519,000 | £84,402,000 | £96,161,000 | £95,550,000 | £109,531,000 | £127,869,000 |

**DEVELOPMENT OF IMPORT TRADE FROM BRITISH POSSESSIONS COMPARED WITH TOTAL IMPORT TRADE FOR PAST 45 YEARS.**

| | 1860 | 1865 | 1870 | 1875 | 1880 | 1885 | 1890 | 1895 | 1900 | 1905 |
|---|---|---|---|---|---|---|---|---|---|---|
| Other Countries | £117,988,000 | £167,285,000 | £188,689,000 | £204,957,000 | £204,887,000 | £185,985,000 | £233,730,000 | £209,760,000 | £252,350,000 | £284,884,000 |
| British Possessions | £46,533,000 | £51,547,000 | £55,391,000 | £76,655,000 | £81,528,000 | £85,490,000 | £94,522,000 | £76,072,000 | £102,024,000 | £122,713,000 |

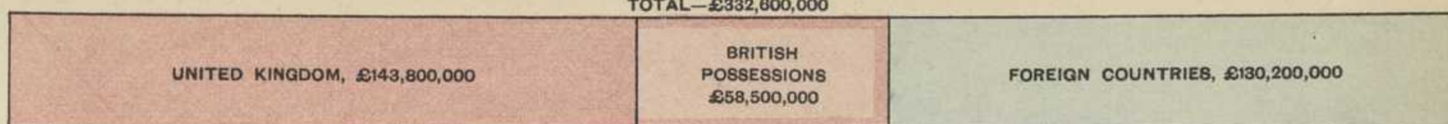
**DEVELOPMENT OF EXPORT TRADE TO BRITISH POSSESSIONS COMPARED WITH TOTAL EXPORT TRADE FOR PAST 45 YEARS.**

# ASPECTS OF BRITISH TRADE

## COLONIAL TRADE, 1905

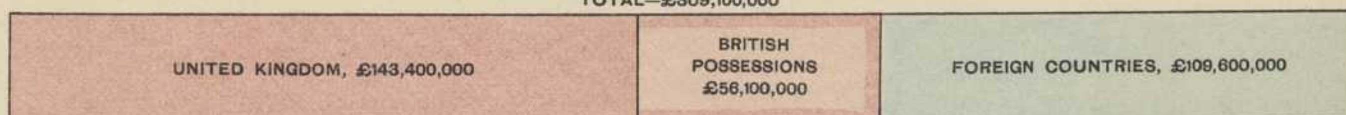
### DESTINATION OF EXPORTS FROM BRITISH POSSESSIONS

TOTAL—£332,600,000



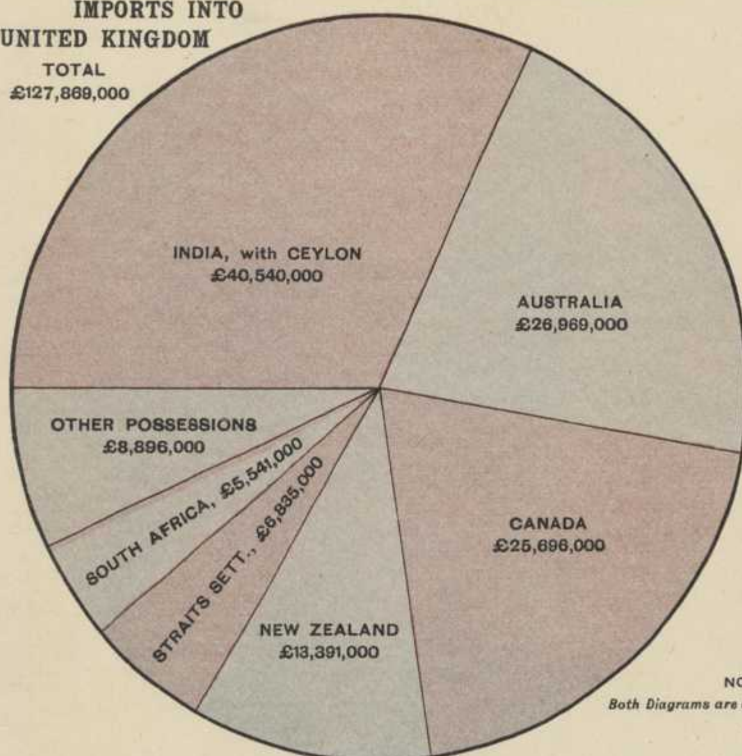

### SOURCES OF IMPORTS INTO BRITISH POSSESSIONS

TOTAL—£309,100,000

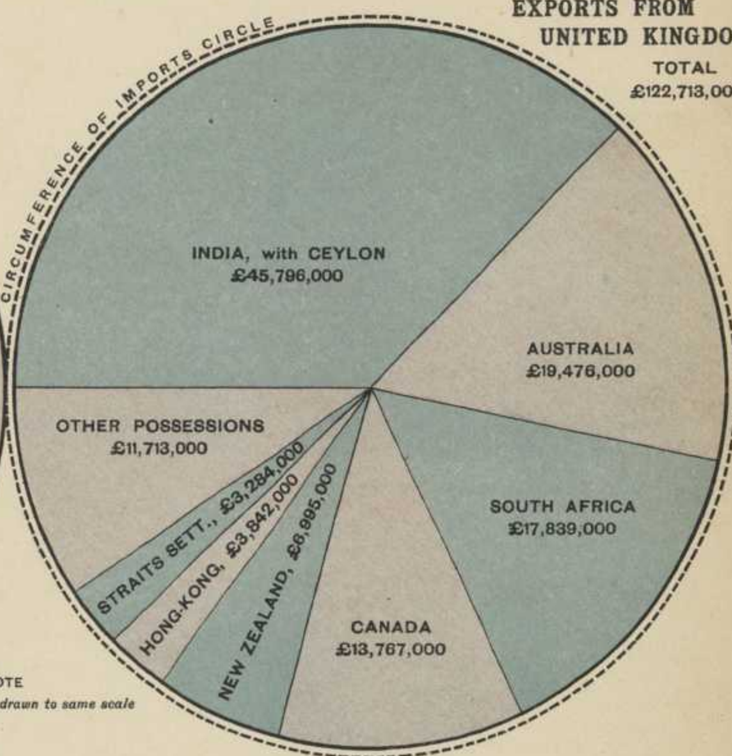



## TRADE OF UNITED KINGDOM WITH BRITISH POSSESSIONS, 1905

IMPORTS INTO UNITED KINGDOM
TOTAL £127,869,000

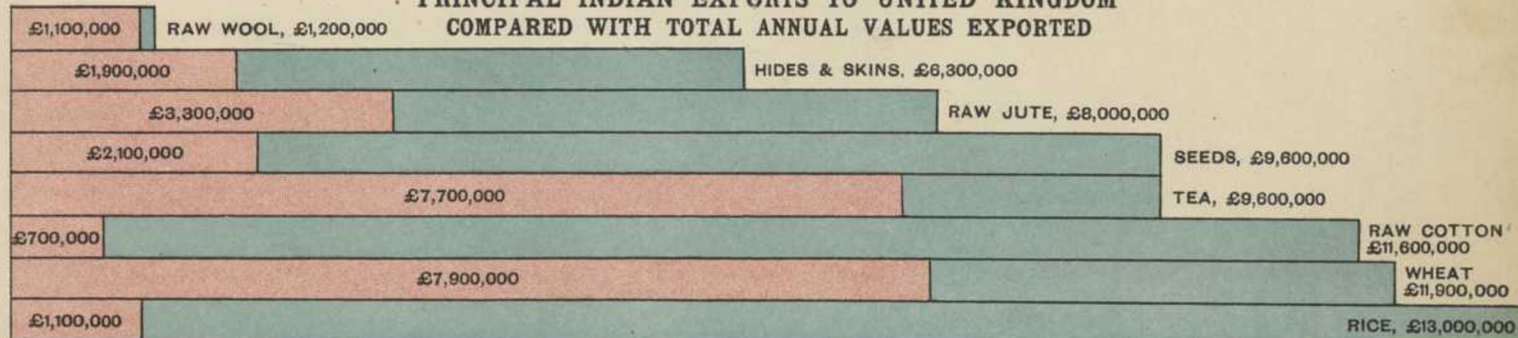



EXPORTS FROM UNITED KINGDOM
TOTAL £122,713,000

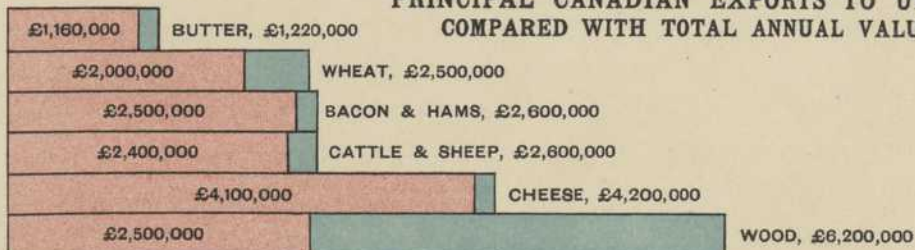



NOTE
*Both Diagrams are drawn to same scale*

## PRINCIPAL INDIAN EXPORTS TO UNITED KINGDOM
### COMPARED WITH TOTAL ANNUAL VALUES EXPORTED

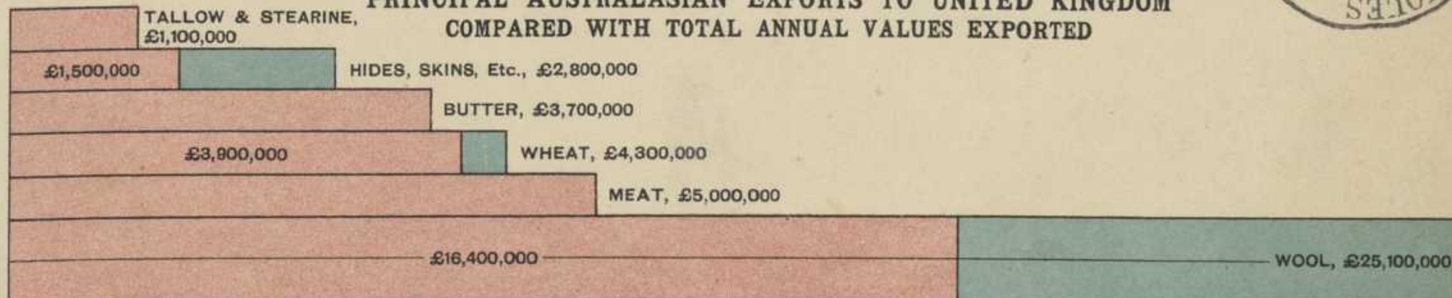



## PRINCIPAL CANADIAN EXPORTS TO UNITED KINGDOM
### COMPARED WITH TOTAL ANNUAL VALUES EXPORTED

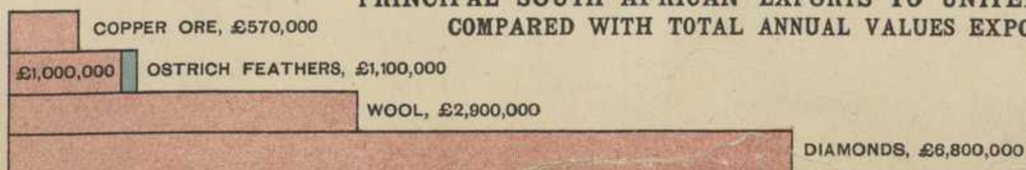





## PRINCIPAL AUSTRALASIAN EXPORTS TO UNITED KINGDOM
### COMPARED WITH TOTAL ANNUAL VALUES EXPORTED




## PRINCIPAL SOUTH AFRICAN EXPORTS TO UNITED KINGDOM
### COMPARED WITH TOTAL ANNUAL VALUES EXPORTED




*NOTE TO EXPORTS DIAGRAMS*
*Trade with United Kingdom* (pink)
*Trade with Other Countries* (blue)

# COMMERCIAL HIGHWAYS OF THE WORLD





**PRINCIPAL HIGHWAYS ON LAND & SEA**

- Railway Routes
- Caravan Routes
- Navigable Rivers
- Steamship Routes

*The Routes with the greatest traffic are indicated by thicker lines*

*The figures on Steamship Routes indicate Distances in Nautical Miles*

**COLOURING TO SHOW HEIGHT OF LAND**

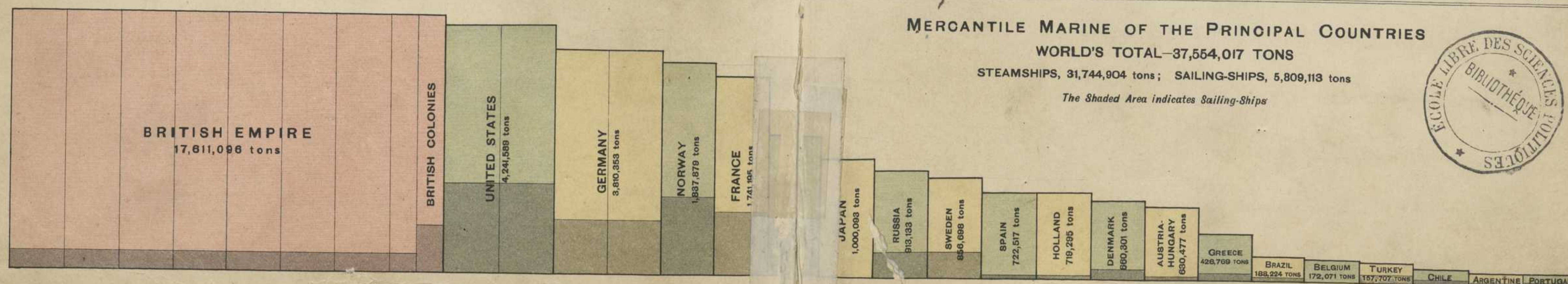
- Above 12,000 feet
- 6,000 to 12,000 feet
- 3,000 to 6,000 feet
- 1.500 to 3,000 feet
- 600 to 1,500 feet
- Sea level to 600 feet

## MERCANTILE MARINE OF THE PRINCIPAL COUNTRIES

**WORLD'S TOTAL—37,554,017 TONS**

**STEAMSHIPS, 31,744,904 tons; SAILING-SHIPS, 5,809,113 tons**

*The Shaded Area indicates Sailing-Ships*



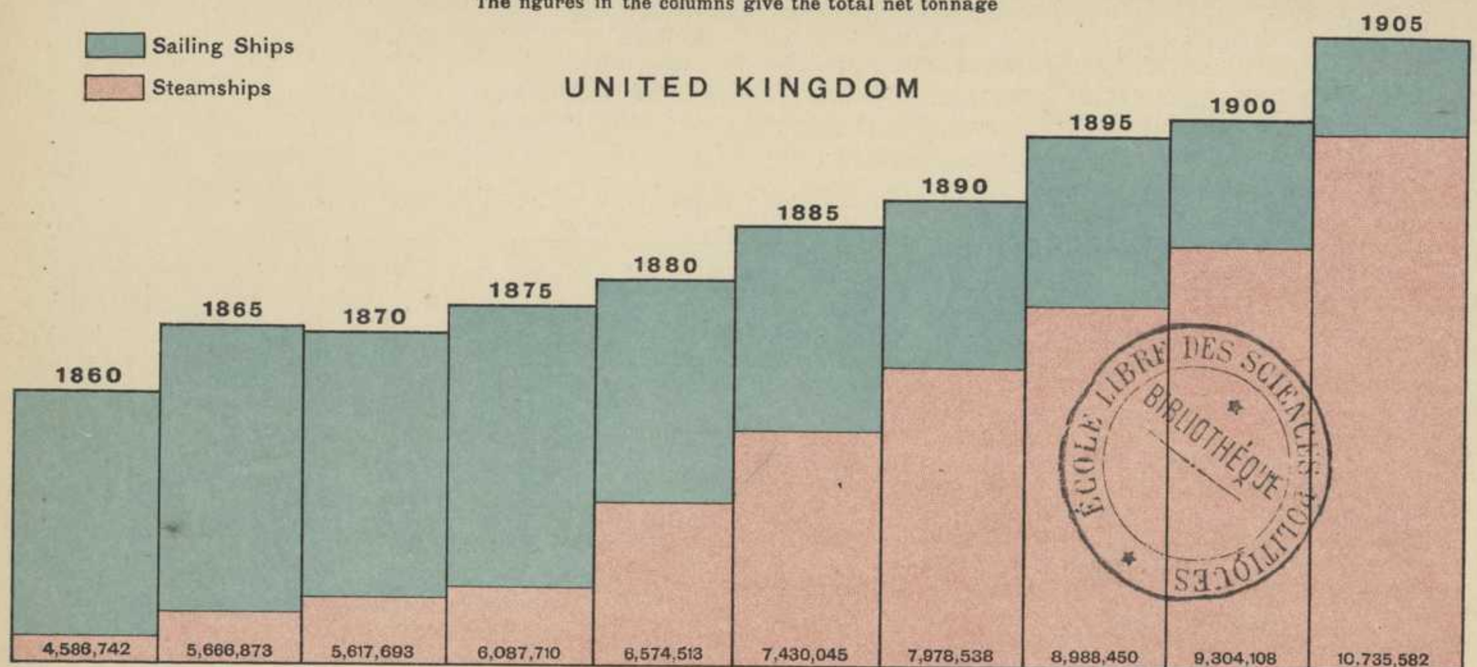



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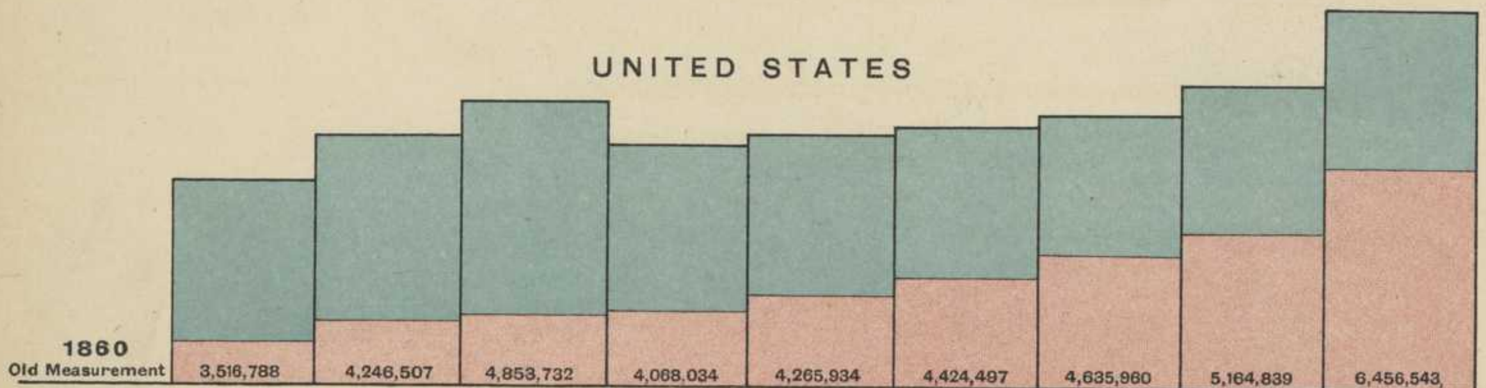
# INTERNATIONAL SHIPPING

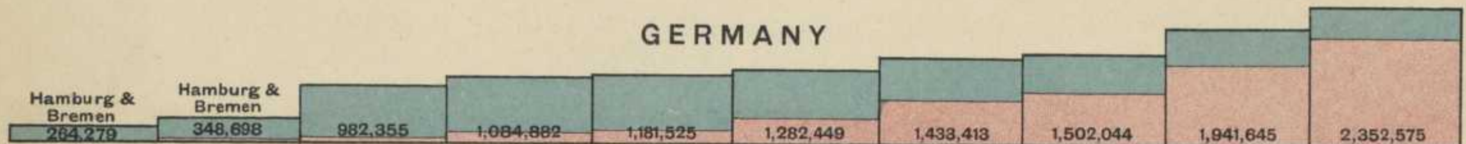
## MERCANTILE MARINE OF THE PRINCIPAL NATIONS

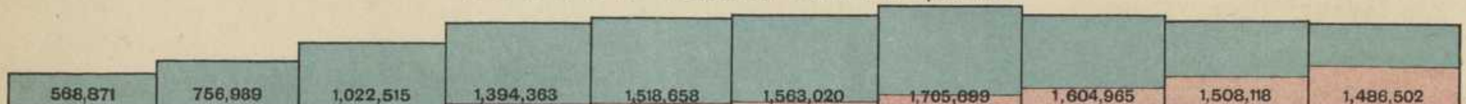
The figures in the columns give the total net tonnage

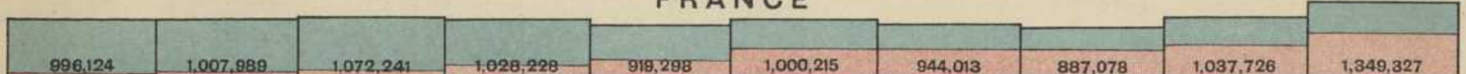


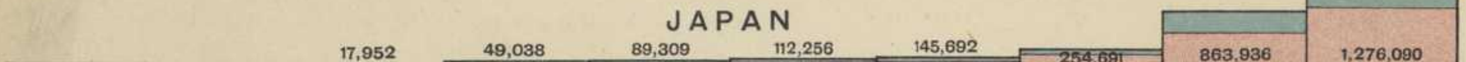




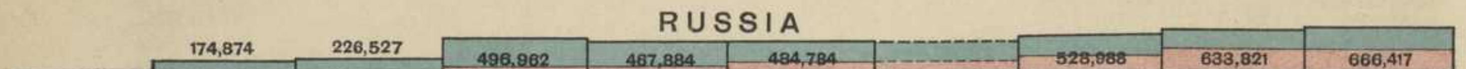





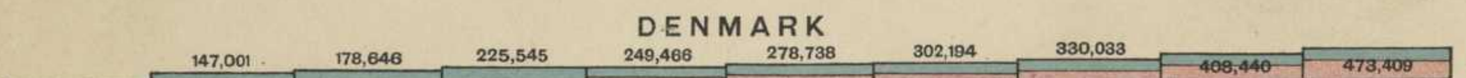


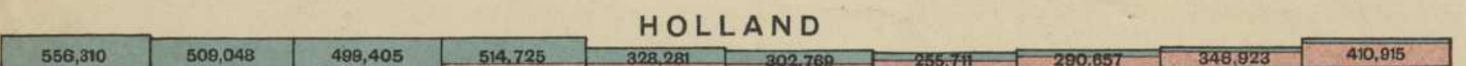






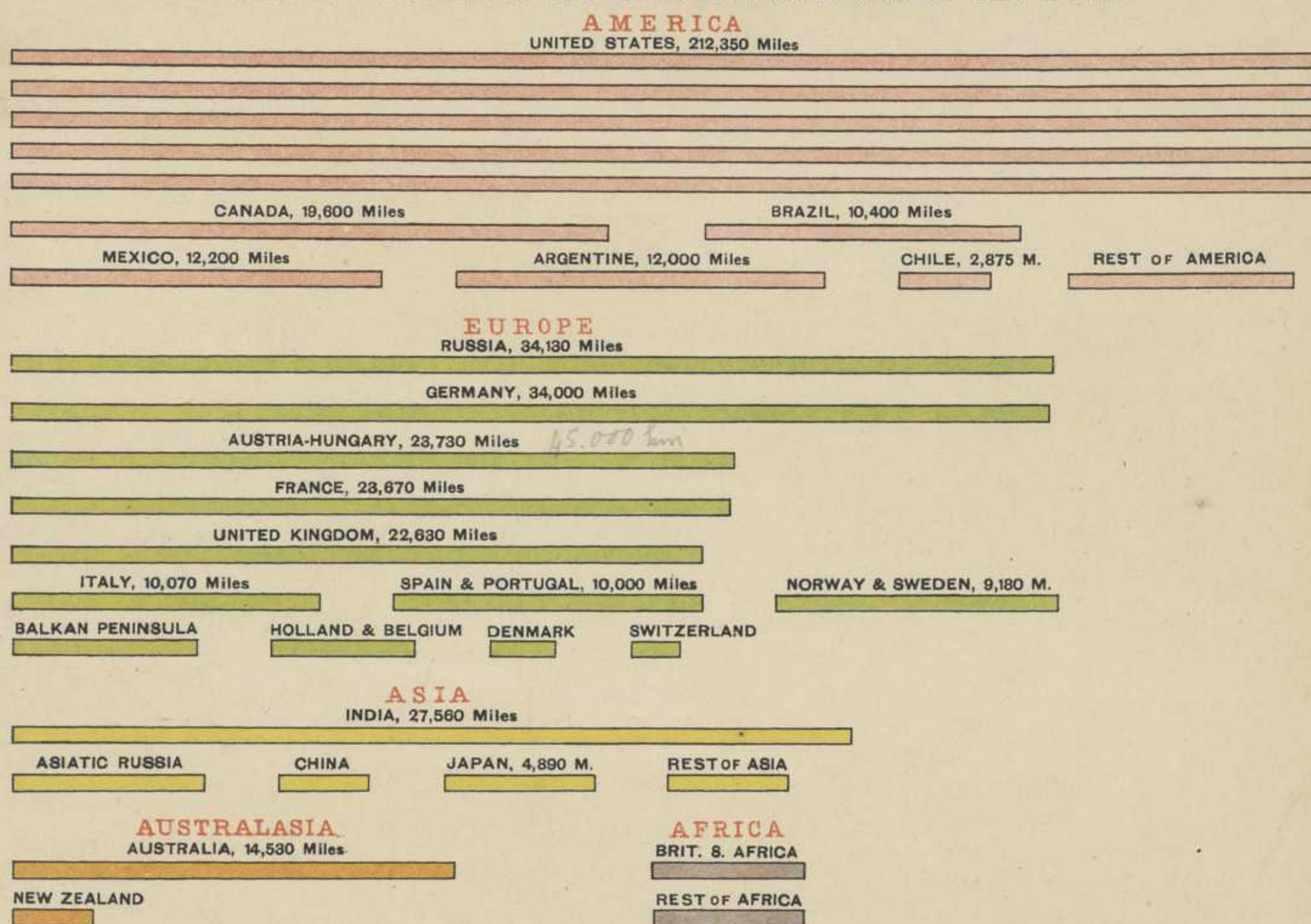


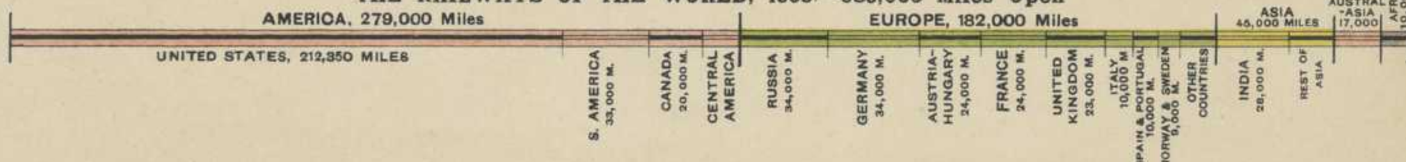

*N.B.—This diagram is compiled from the British "STATISTICAL ABSTRACTS." For the diagram on plates 22 and 23 the figures of "LL D'S REGISTER BOOK" have been taken, which includes only vessels of 100 tons and upwards, and gives the gross tonnage for steam vessels*

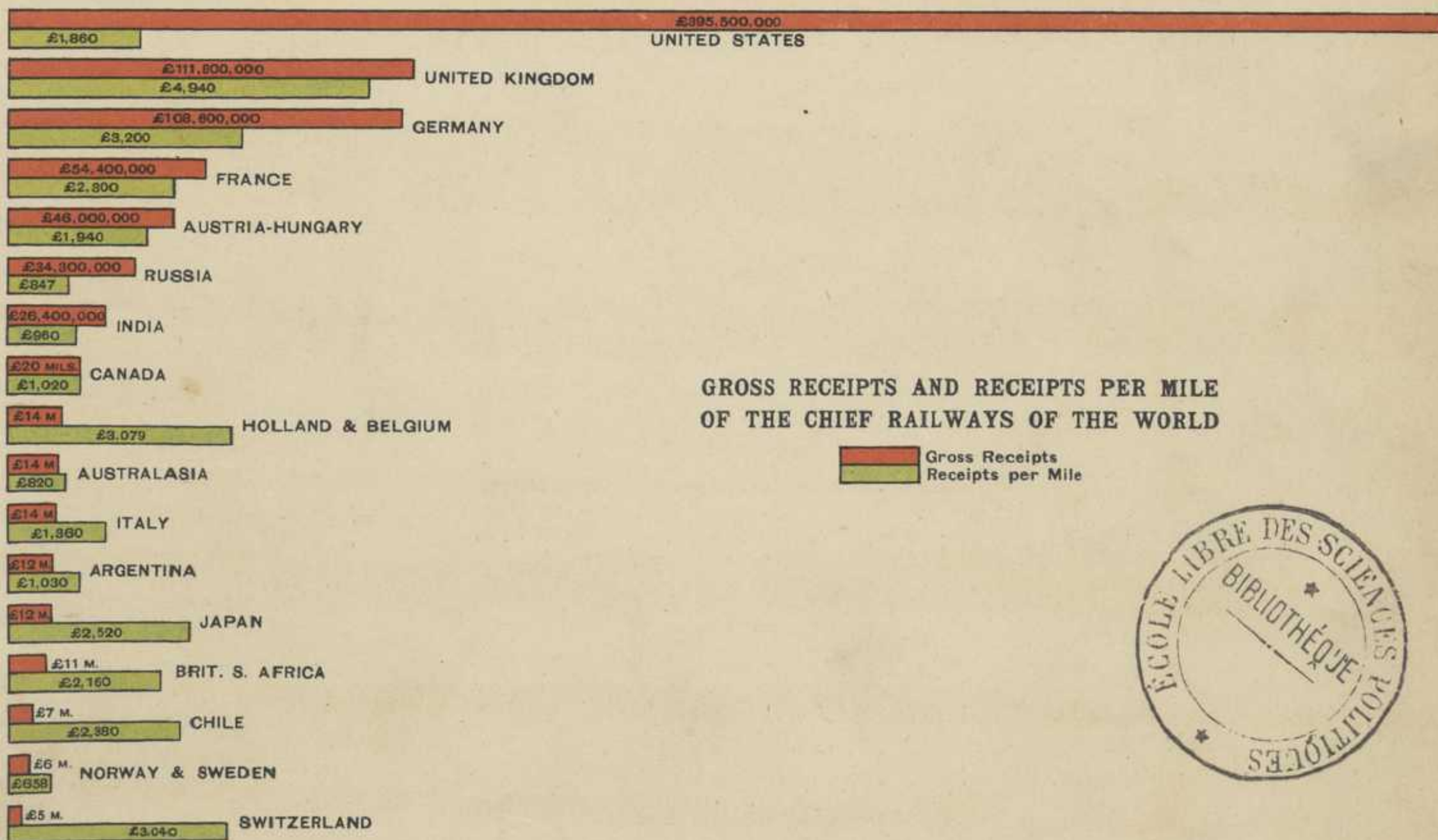
# INTERNATIONAL RAILWAYS

## LENGTH OF RAILWAYS IN THE PRINCIPAL COUNTRIES OF THE WORLD




## THE RAILWAYS OF THE WORLD, 1905.—533,000 Miles Open

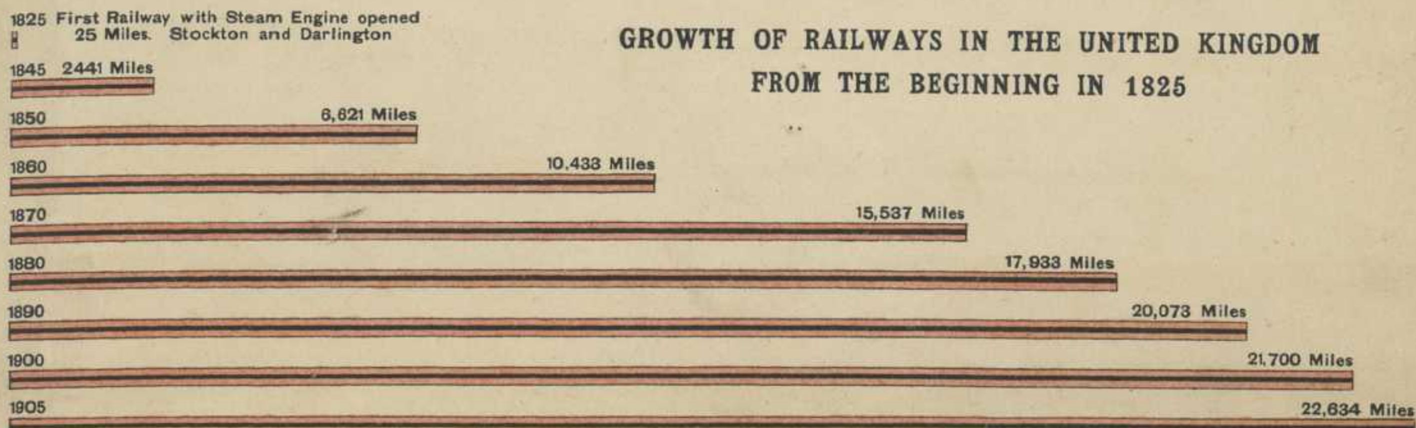



## GROSS RECEIPTS AND RECEIPTS PER MILE OF THE CHIEF RAILWAYS OF THE WORLD




## GROWTH OF RAILWAYS IN THE UNITED KINGDOM FROM THE BEGINNING IN 1825




John Bartholomew & Co. Edin.

# BRITISH NAVAL CHART



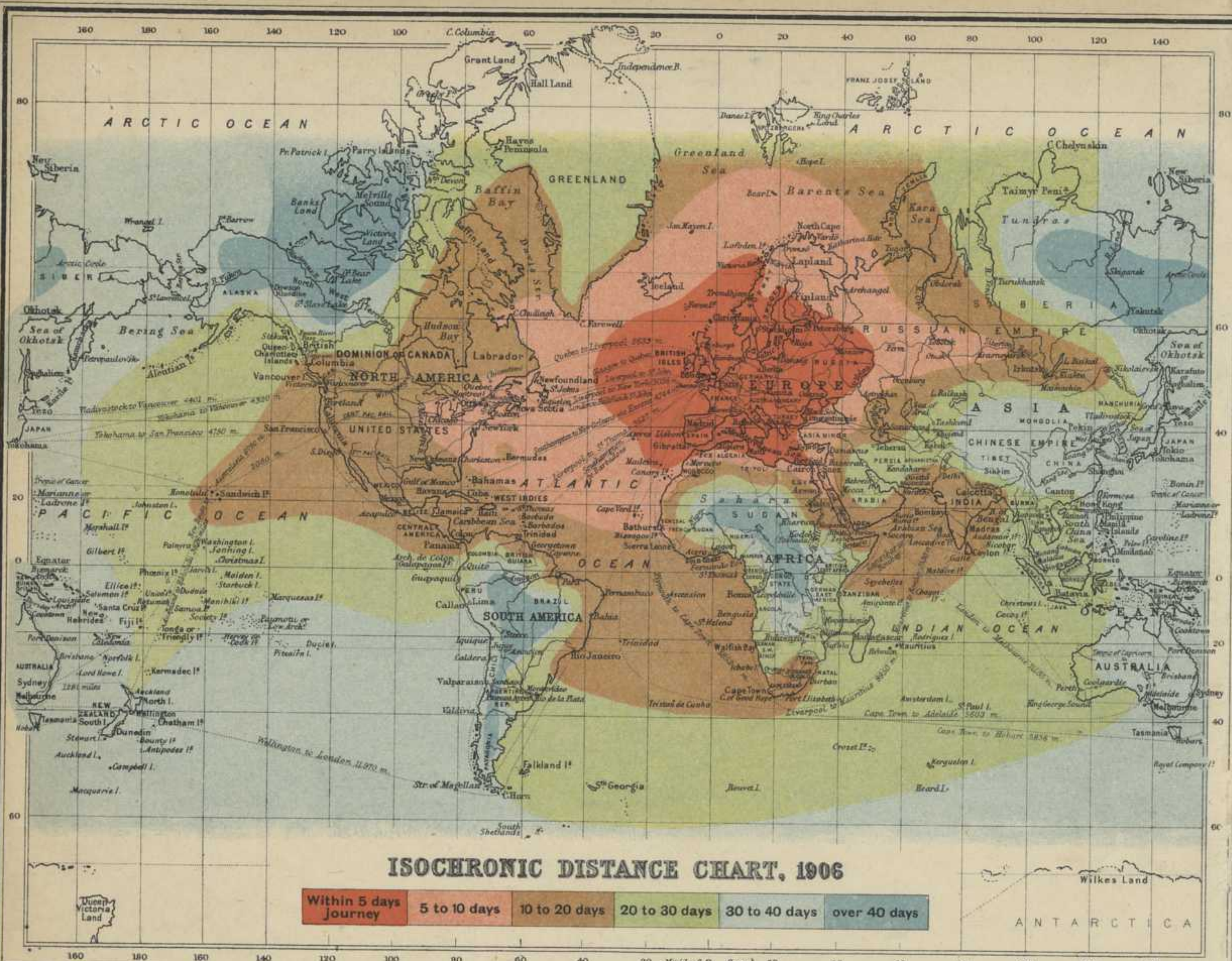


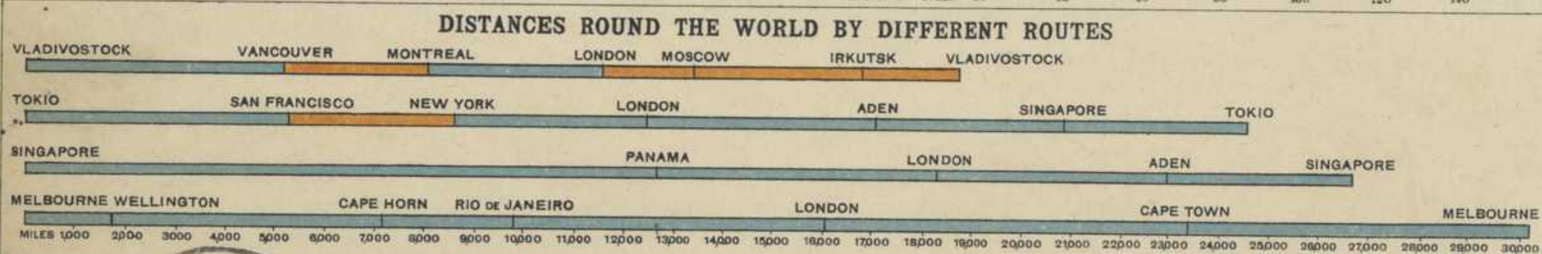
ÉCOLE LIBRE DES SCIENCES POLITIQUES BIBLIOTHÈQUE

## COMPARATIVE STRENGTH OF NATIONAL NAVIES (INCLUDING SHIPS BUILDING), 1906 (According to Statesman's Year Book 1906.)

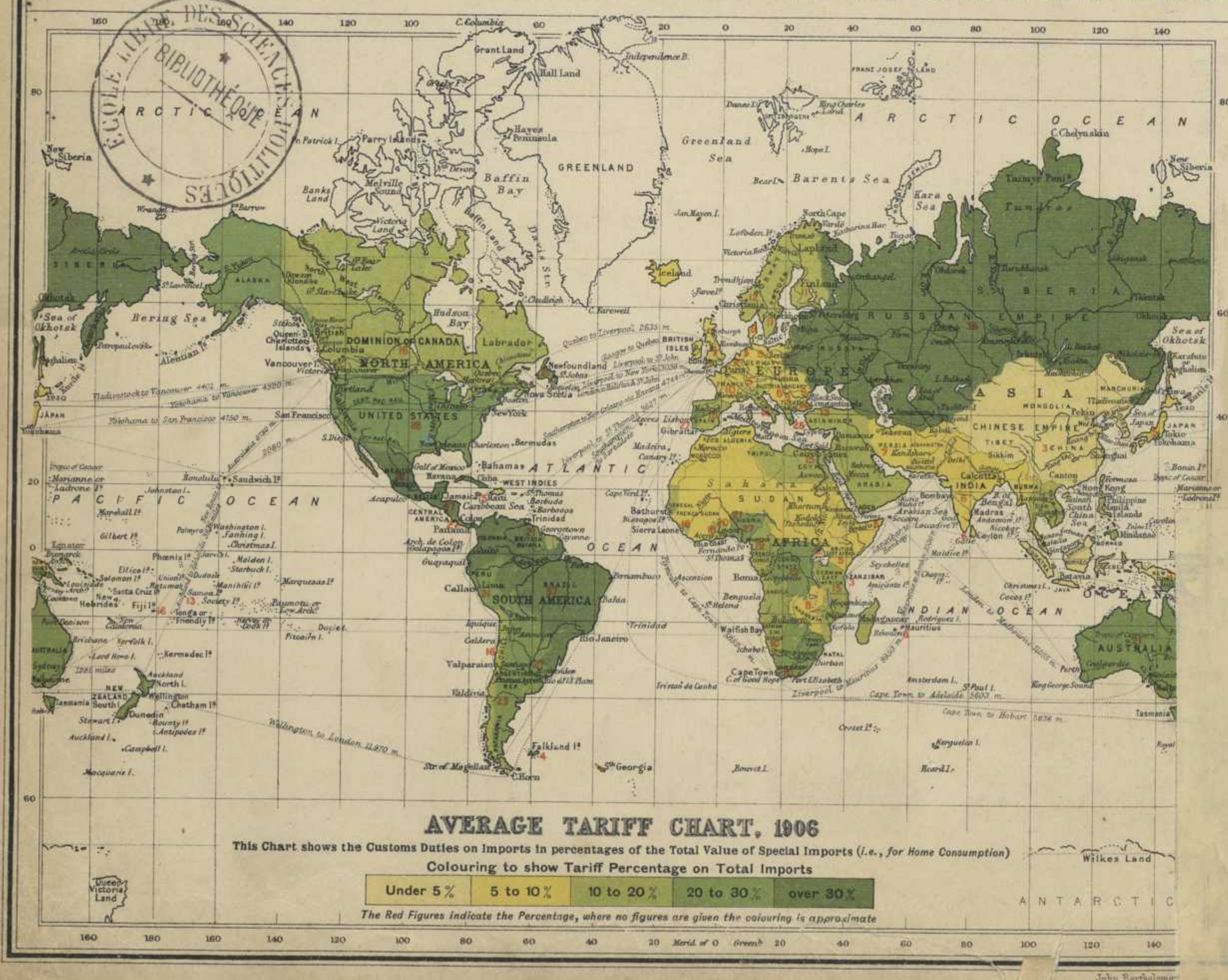
| Nation | Battleships | Armoured Cruisers | Protected Cruisers | Gunboats & Torpedo Craft | Submarines |
|---|---|---|---|---|---|
| UNITED KINGDOM | 50 BATTLESHIPS | 35 ARMOURED CRUISERS | 64 PROTECTED CRUISERS | 230 GUNBOATS & TORPEDO CRAFT | 45 SUBMARINES |
| FRANCE | 35 BATTLESHIPS | 16 ARMOURED CRUISERS | 43 PROTECTED CRUISERS | 254 GUNBOATS & TORPEDO CRAFT | 38 SUBMARINES |
| GERMANY | 37 BATTLESHIPS | 7 ARMOURED CRUISERS | 40 PROTECTED CRUISERS | 115 GUNBOATS & TORPEDO CRAFT | 5 SUB. |
| UNITED STATES | 26 BATTLESHIPS | 15 ARMOURED CRUISERS | 29 PROTECTED CRUISERS | 44 SCOUTS & TOR. CR. | 12 SUBMARINES |
| JAPAN | 17 BATTLESHIPS | 11 ARM. CRUISERS | 17 PROT. CRUISERS | 88 GUNBOATS & TORPEDO CRAFT | |
| RUSSIA | 17 BATTLESHIPS | 2 ARM. CRU. | 15 PROTECTED CRUISERS | 156 GUNBOATS & TORPEDO CRAFT | 22 SUBMARINES |
| ITALY | 16 BATTLESHIPS | 6 ARM. CRU. | 14 PROTECTED CRUISERS | 64 GUNBOATS AND TORPEDO CR. | 5 SUB. |
| AUST.-HUNG. | 12 BATTLESHIPS | 3 A.C. | 5 PROT. CRU. | 42 GUNS. & TOR. CR. | |
| PORT. | | 1 A.C. | 5 PROT. CRU. | 43 GUNB. ETC. | |
| SPAIN | 1 BATTLESHIP | 2 A.C. | 6 PROT. CRU. | 11 TOR. | |

John Bartholomew & Co., Edin.

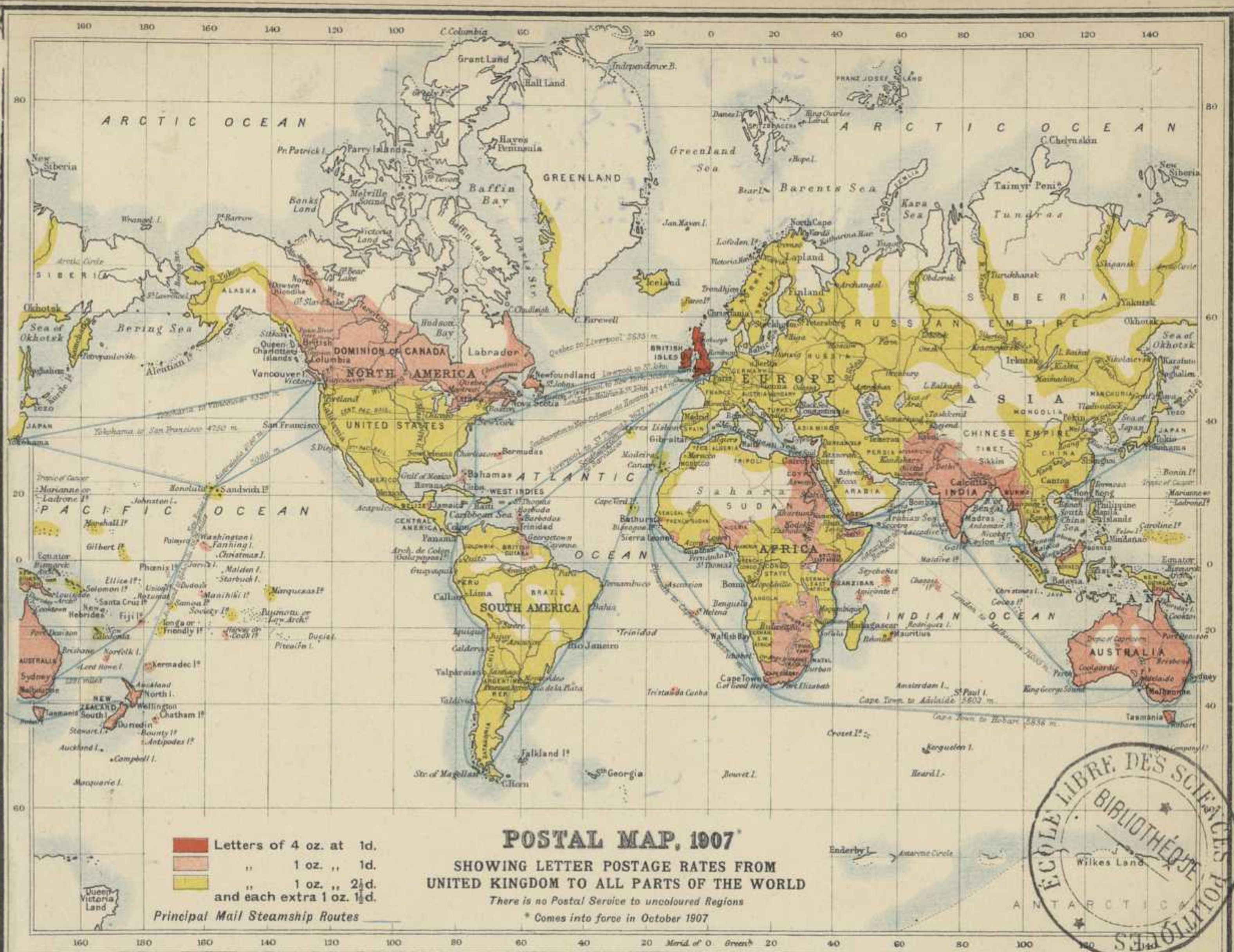





John Bartholomew

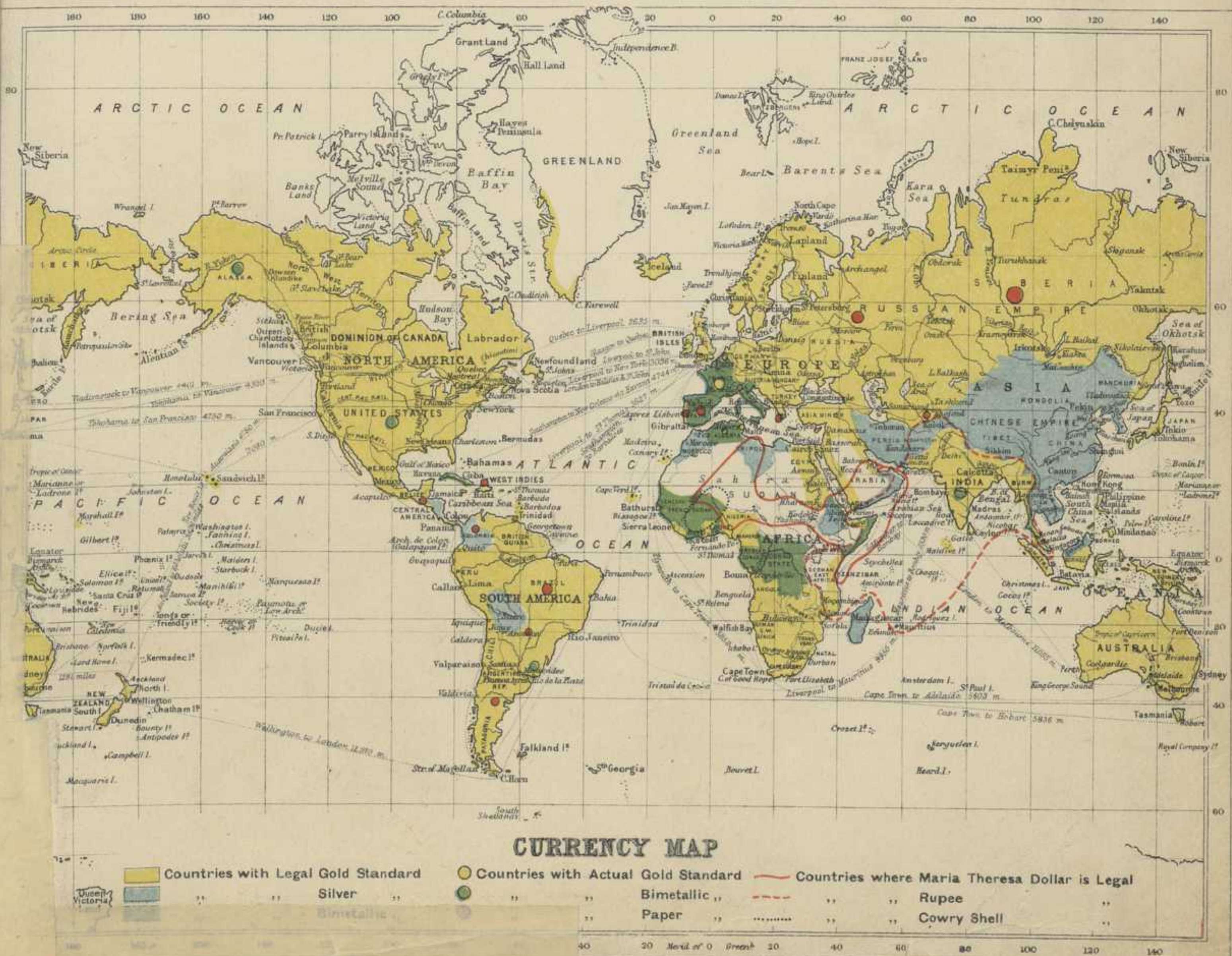




## LETTERS AND POST CARDS HANDLED IN THE POST OFFICES OF THE WORLD, 1904

Total – 20,484,000,000

| Country | Letters and post cards |
|---|---|
| United Kingdom | 3,360,100,000 |
| India | 614,706,000 |
| Other British Possessions | 711,226,000 |
| Germany | 3,565,705,000 |
| Austria-Hungary | 1,584,272,000 |
| France | 1,000,078,000 |
| Russia | 658,989,000 |
| Norway & Sweden | 432,655,000 |
| Italy | 395,392,000 |
| Rest of Europe | 1,125,257,000 |
| United States | 5,224,252,000 |
| Japan | 882,416,000 |
| Argentine | 450,557,000 |
| Other Countries | |



# TELEGRAPHIC COMMUNICATION

NORTH AMERICA
DOMINION OF CANADA
UNITED STATES
GREENLAND
SOUTH AMERICA
EUROPE
RUSSIAN EMPIRE
SIBERIA
ASIA
CHINESE EMPIRE
INDIA
AFRICA
AUSTRALIA
NEW ZEALAND
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN




**EXPLANATORY NOTE**

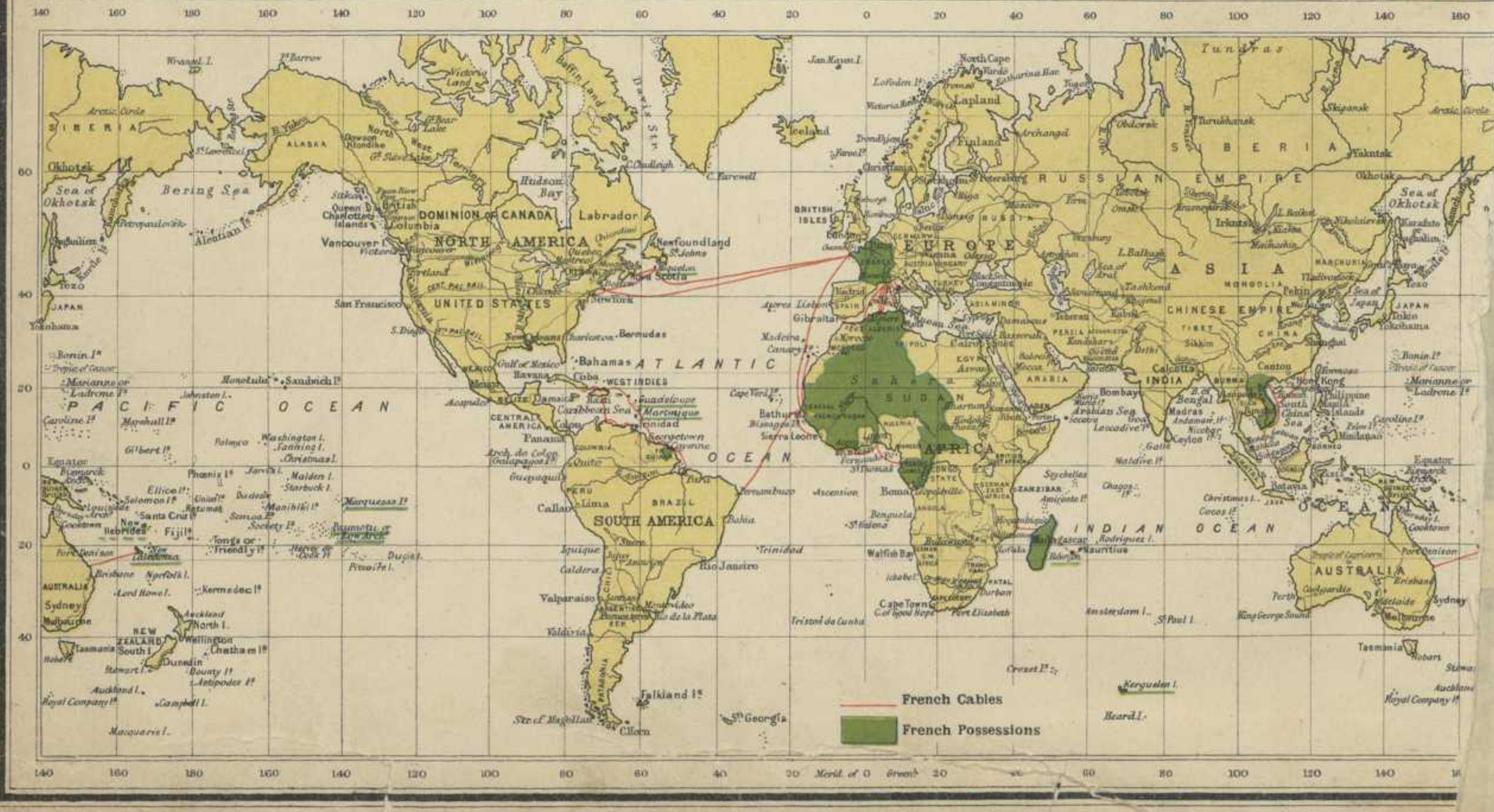
British Cables — Foreign Cables

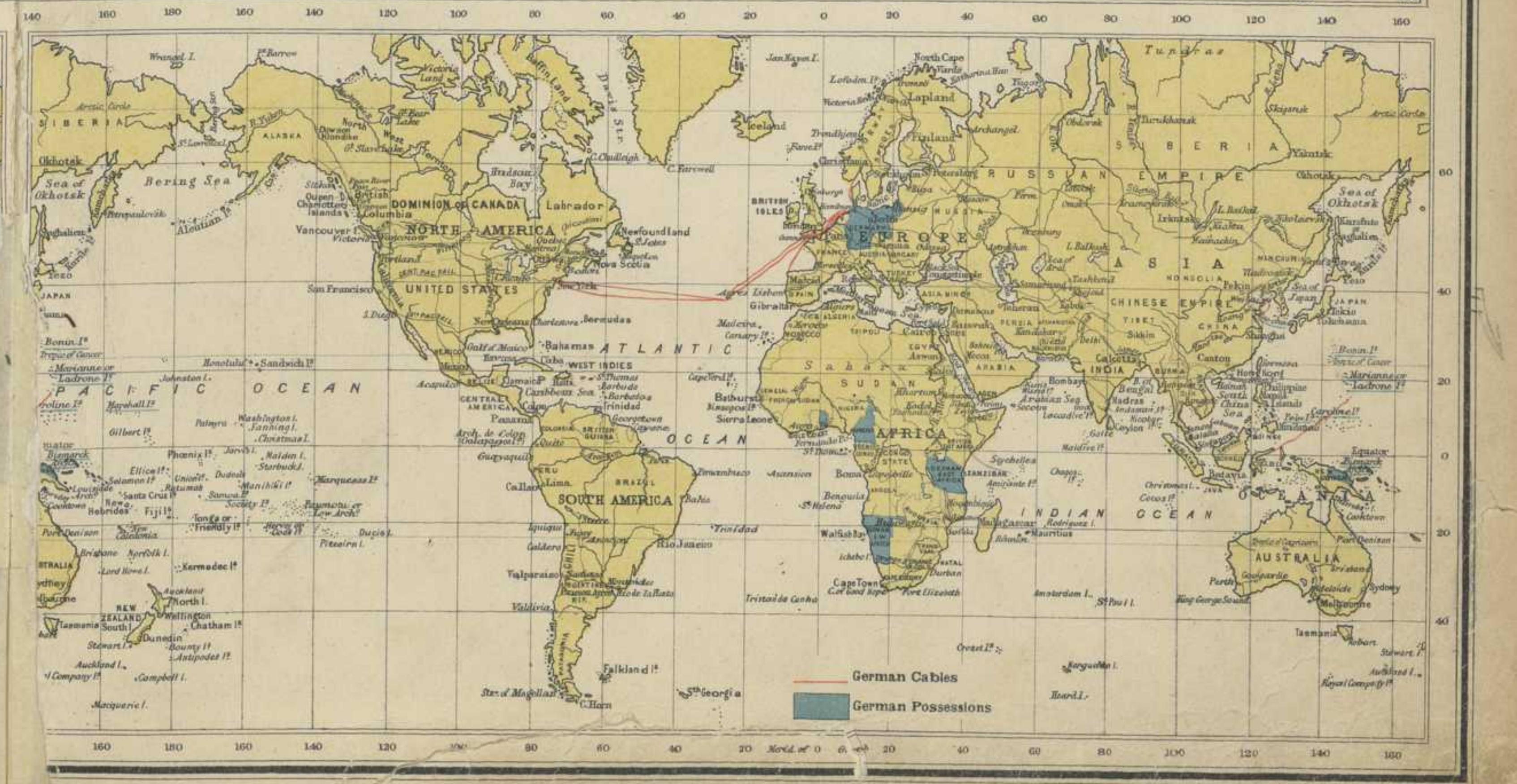
Principal Land Telegraphs

Countries with Telegraphic Communication

Regions without Telegraphic Communication



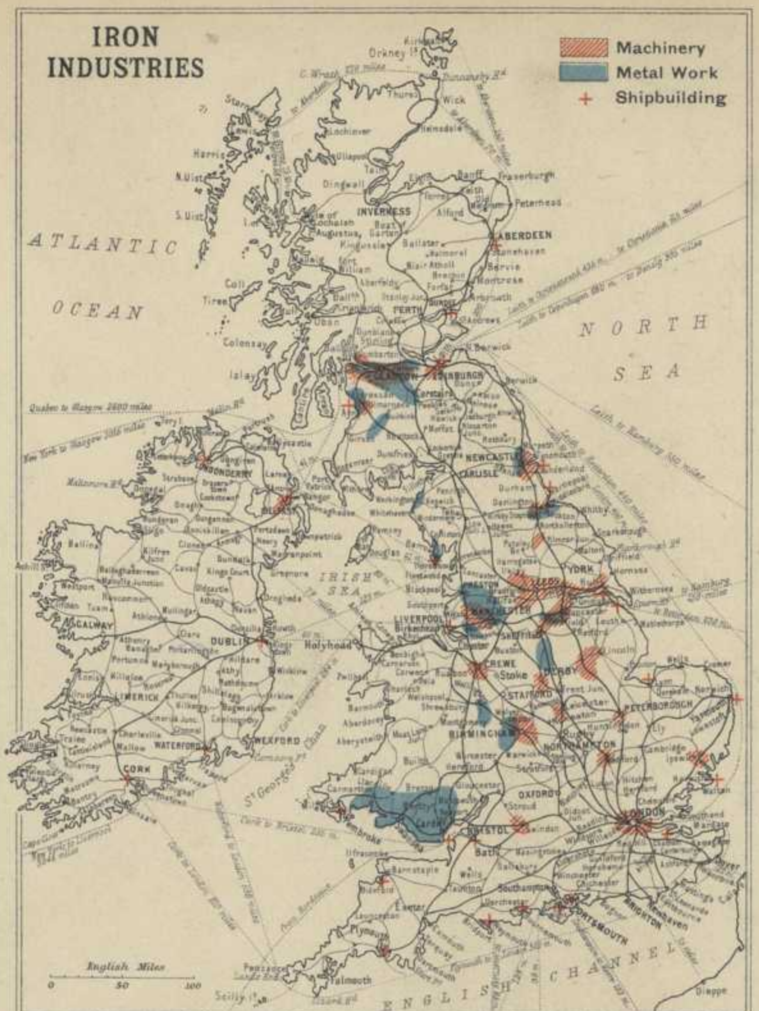



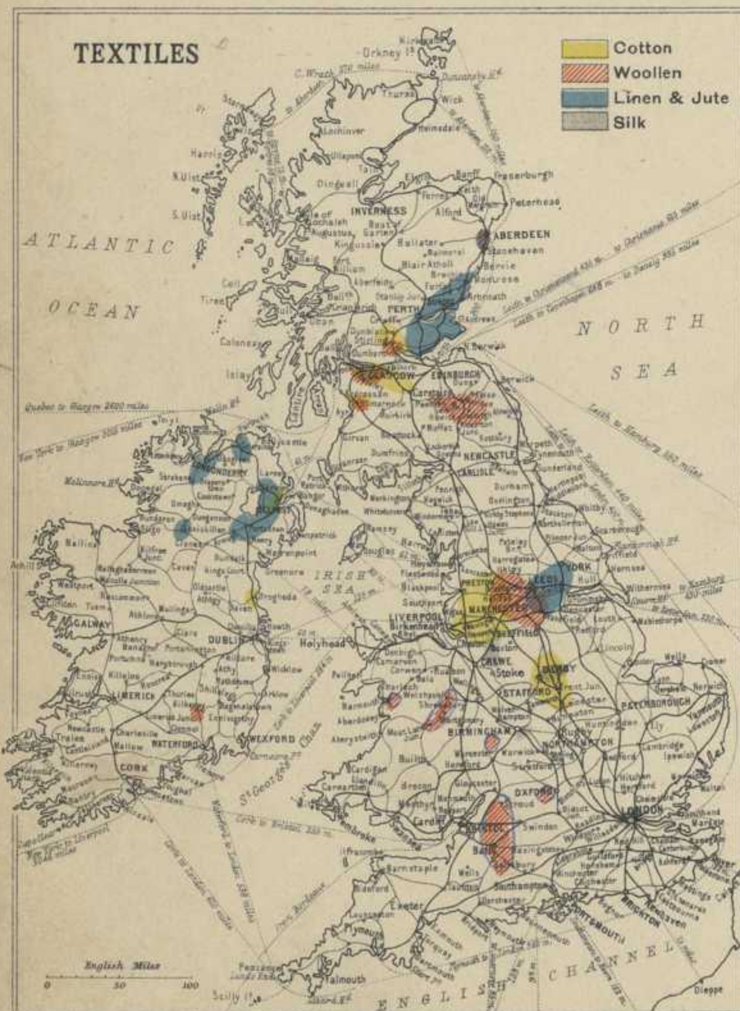



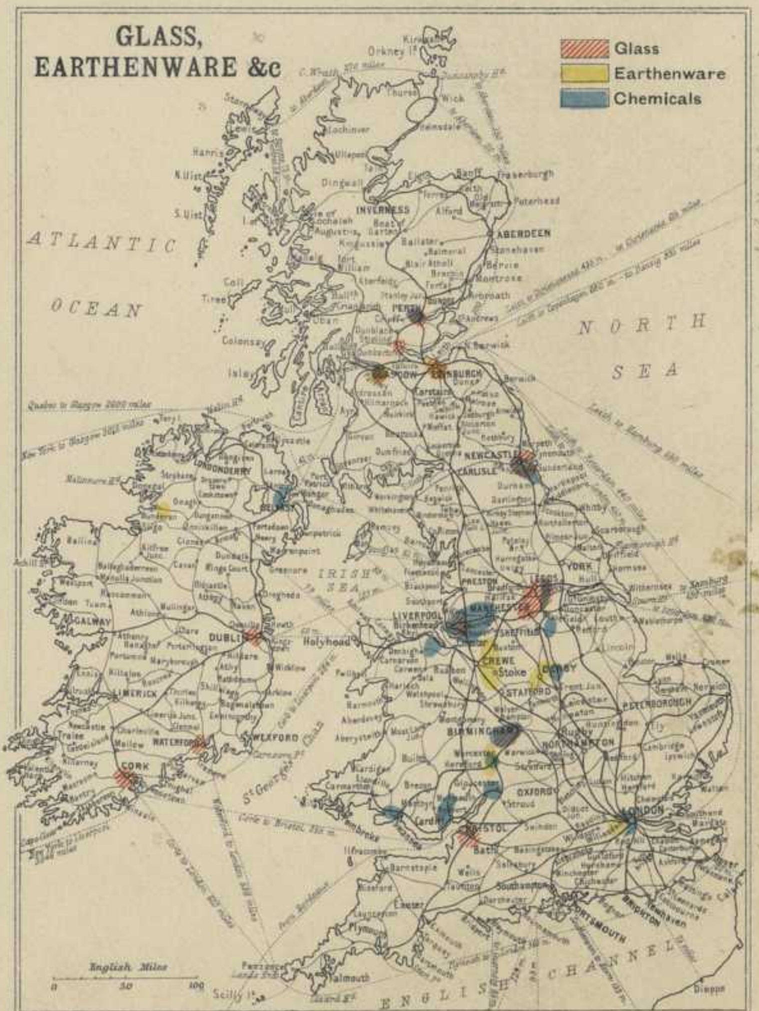

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# BRITISH ISLES - INDUSTRIAL



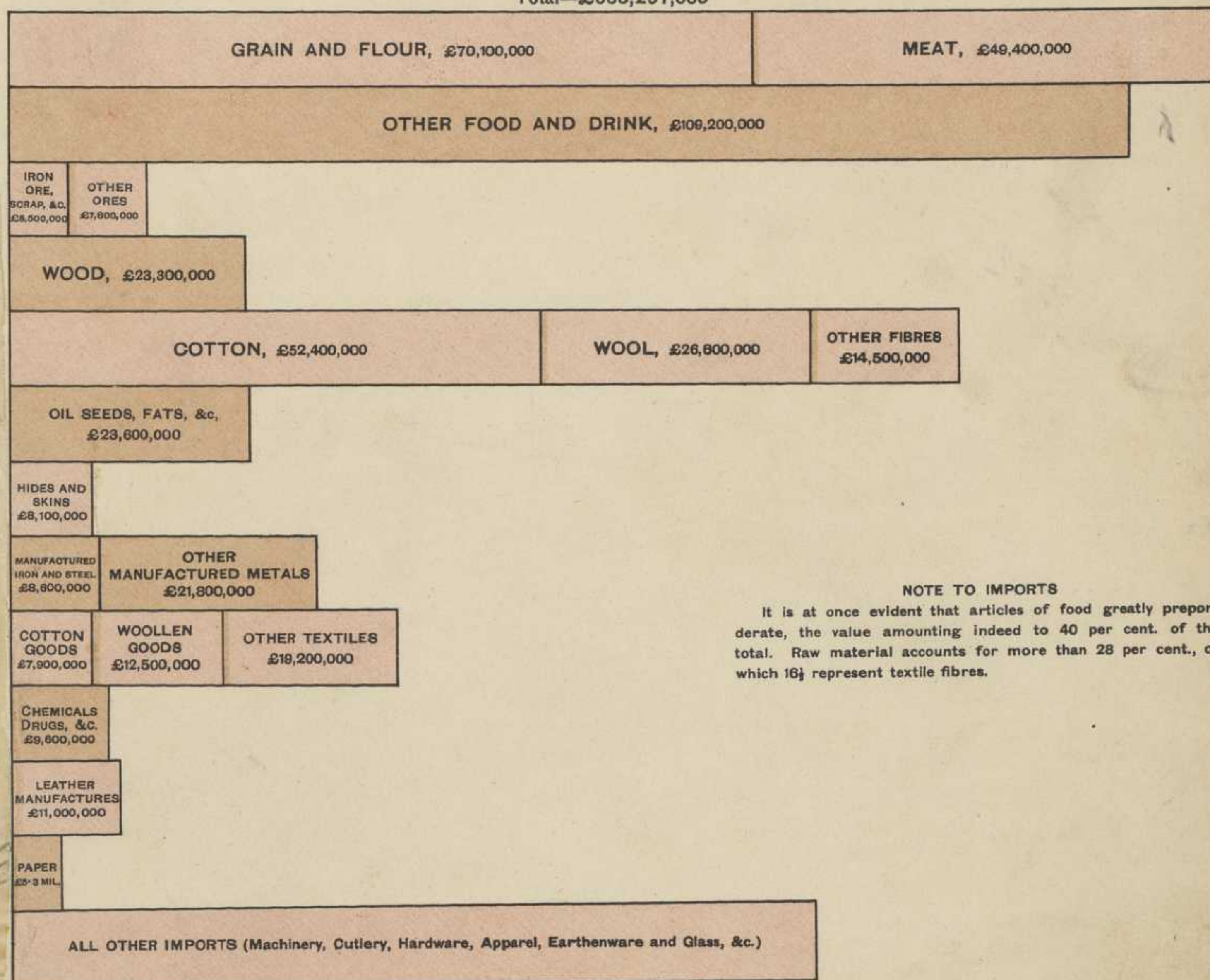






# IMPORT & EXPORT TRADE OF UNITED KINGDOM

## IMPORTS IN 1905; DISTINGUISHING ARTICLES IMPORTED

Total—£565,297,000



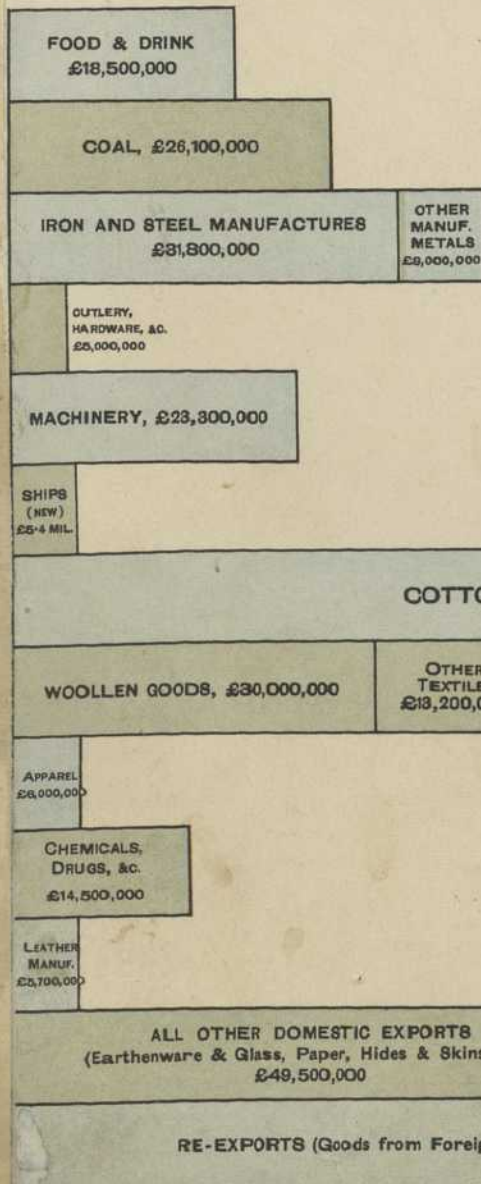

**NOTE TO IMPORTS**

It is at once evident that articles of food greatly preponderate, the value amounting indeed to 40 per cent. of the total. Raw material accounts for more than 28 per cent., of which 16½ represent textile fibres.

## EXPORTS IN 1905; DISTINGUISHING ARTICLES EXPORTED

Total—Domestic Exports, £330,023,000
Re-Exports, £77,798,000




**NOTE TO EXPORTS**

Textile Manufactures are the most important exports; their value is nearly 41 per cent. of that of the total domestic exports. Metal manufactures account for 29 per cent., and coal for 8 per cent.; 22 per cent. are left for other articles.

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ICELAND
BRITISH ISLES
SCOTLAND
IRELAND
ENGLAND
NORTH SEA
FINLAND
RUSSIA
WHITE SEA
GERMANY
FRANCE
AUSTRIA
HUNGARY
Bay of Biscay
SPAIN
ITALY
TURKEY
BLACK SEA
MEDITERRANEAN SEA
TUNIS
ALGERIA
MOROCCO
TRIPOLI
Canaries
RIO DE ORO
Asia Minor
TURKEY IN ASIA
PERSIA
AFGHANISTAN
BALUCHISTAN
ARABIA
NEDJED
Nubian Desert
Trans-Caspian District
DIAGRAM SHOWING RELATIVE AMOUNT OF SHIPPING PASSING THROUGH SUEZ CANAL IN 1905
UNITED KINGDOM
2,484 VESSELS
8,356,940 NET TONNAGE
GERMANY
600 VESSELS
2,113,484 NET TONNAGE
FRANCE
272 VESSELS (844,372 N. TON.)
NETHERLANDS, 218 VESSELS
AUSTRIA-HUNGARY, 139 VESSELS
ITALY, 91 VESSELS
OTHER NATIONS
311 VESSELS
SUEZ CANAL
Port Saïd
Suez
NOTE TO VEGETATION COLOURING
Forests, chiefly coniferous
Trees, Grassland & Cultivation
Prairies and Steppes
Barren Desert
High Mountain Flora
Tundra or Frozen Soil
NOTE TO COMMERCIAL FEATURES
Principal Railways
" Canals
4750 Ocean Steamer Routes with distances in nautical miles
Navigable Rivers
Submarine Cables & Telegraphs
1054 4600 Deep Sea soundings in fathoms
British Consul General
" Consul
" Vice-Consul or Agent
VERTICAL DISTRIBUTION OF VEGETATION

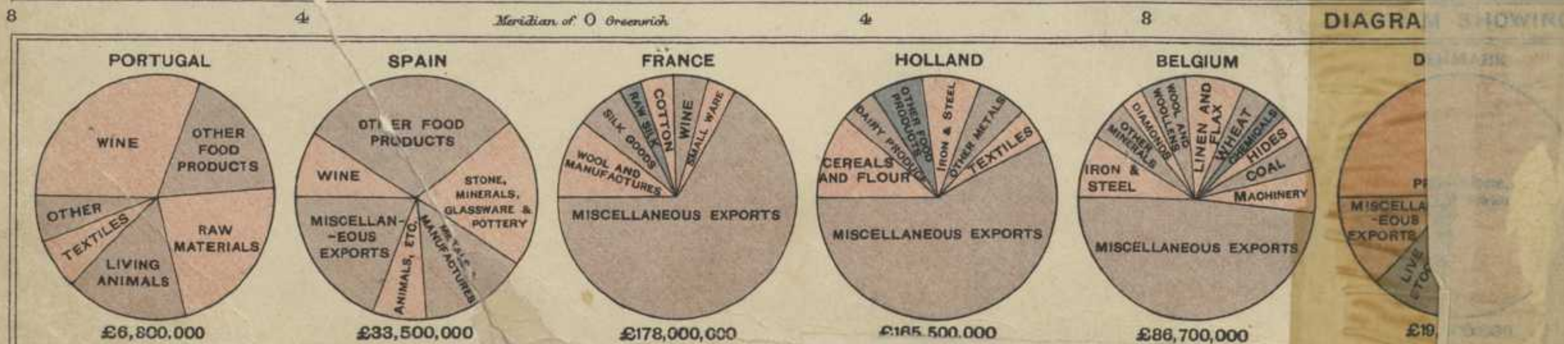


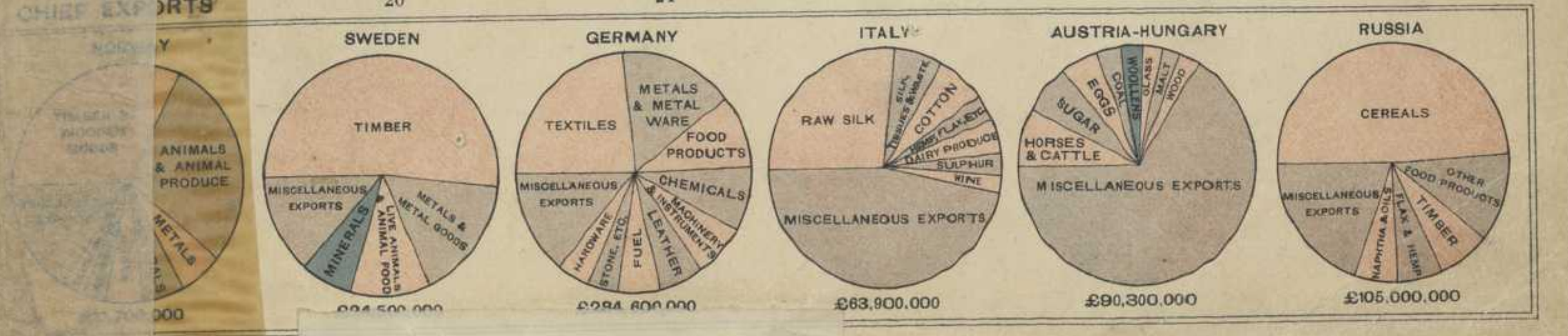




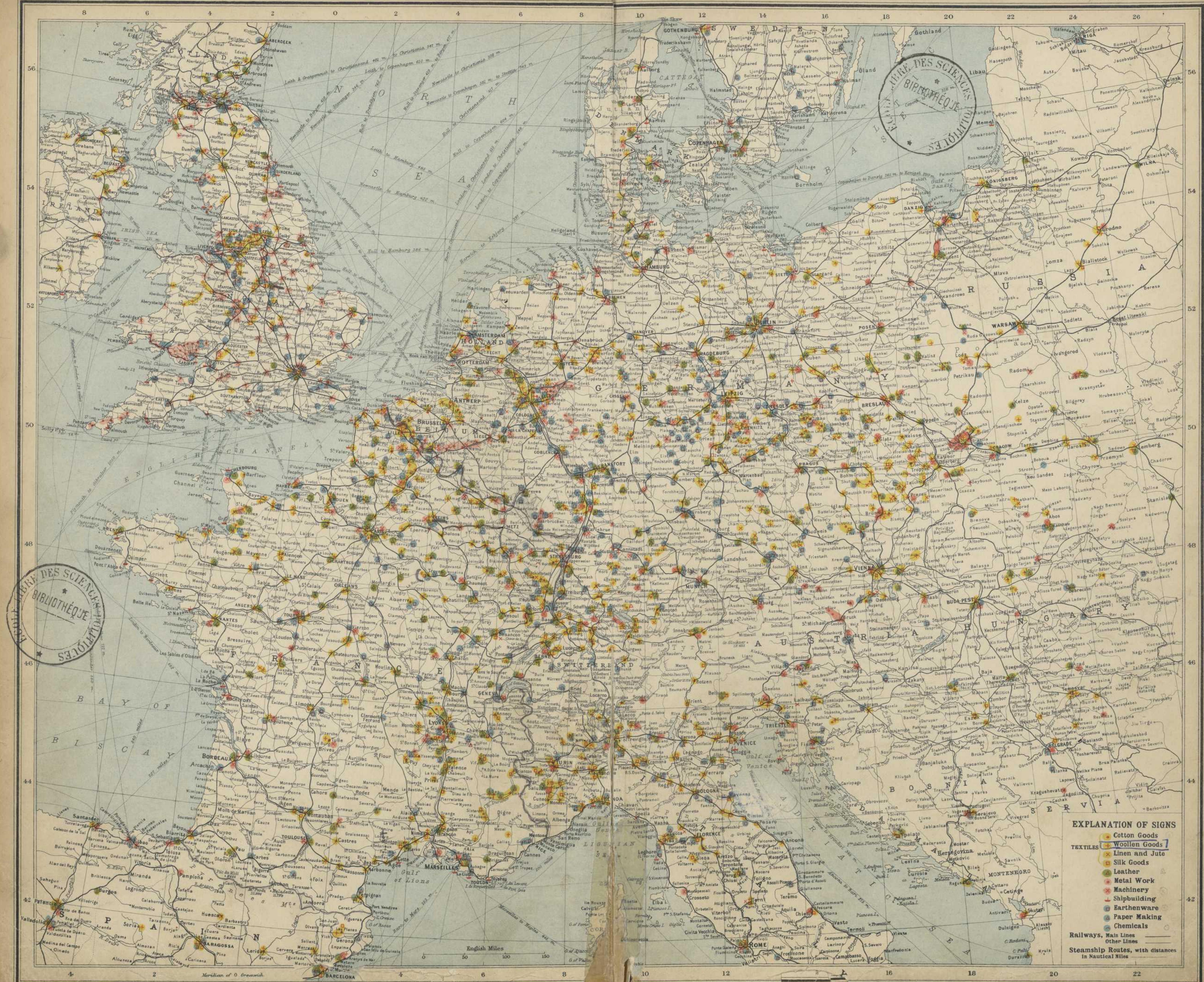


DIAGRAM SHOWING CHIEF EXPORTS

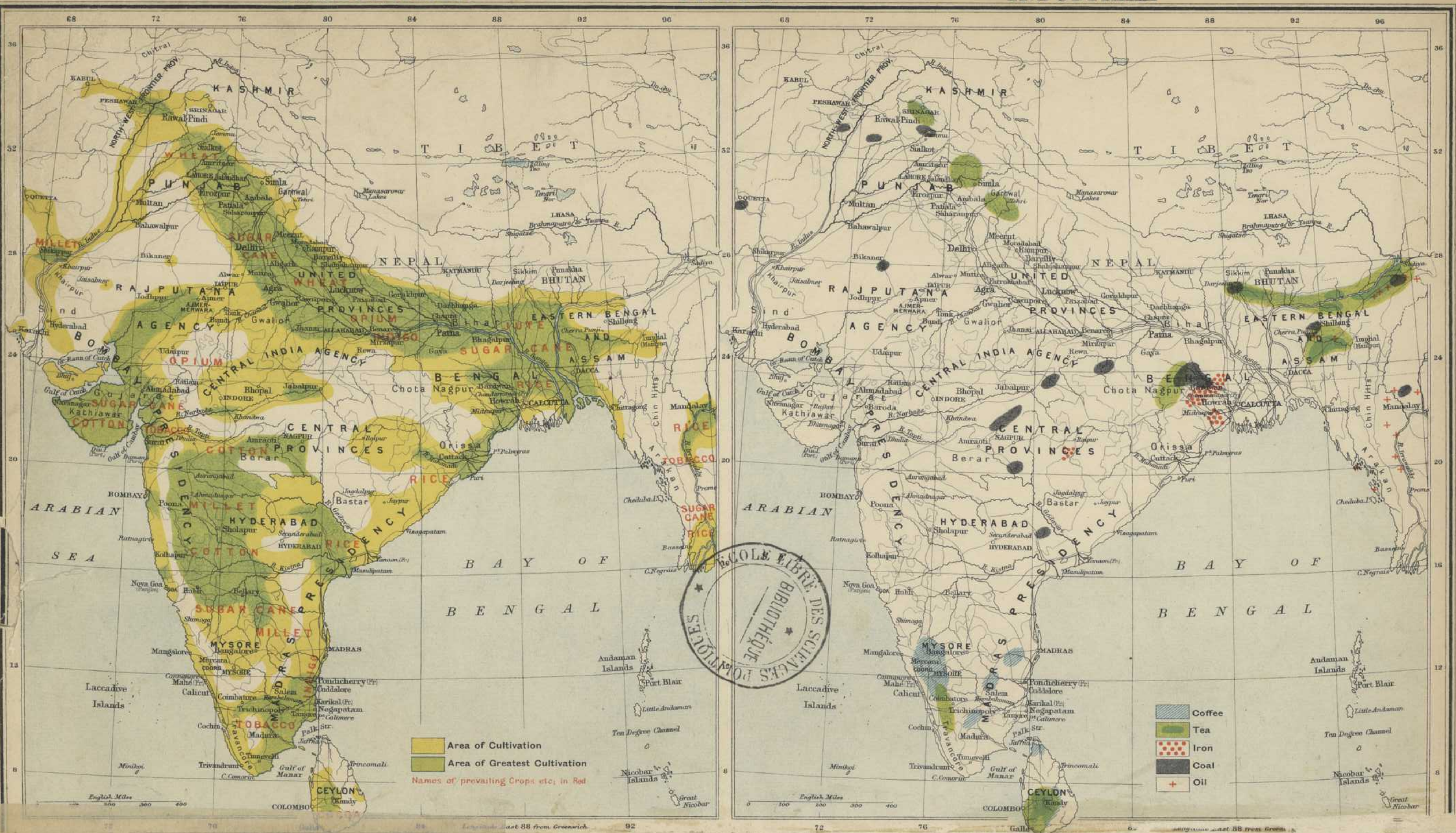


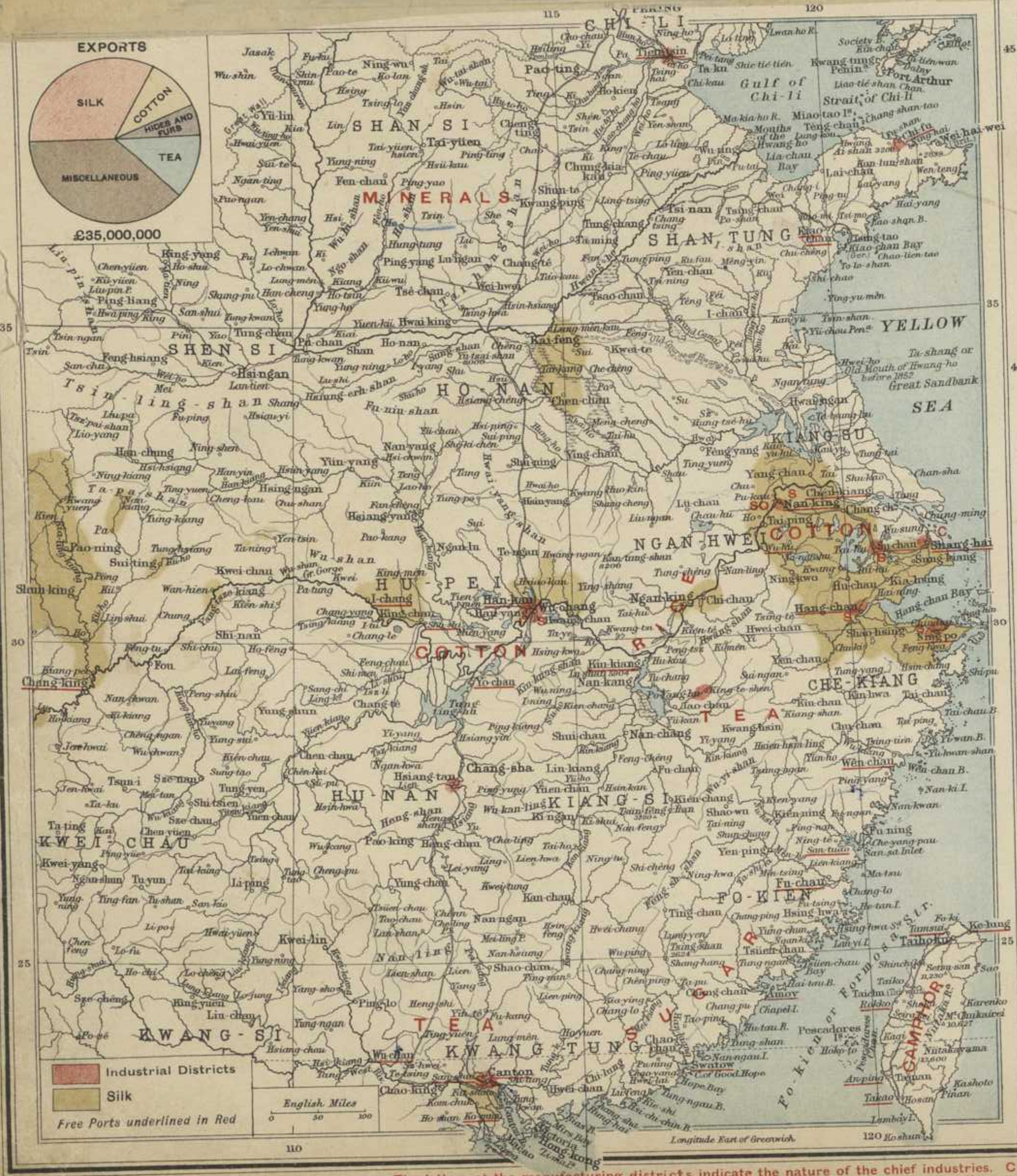

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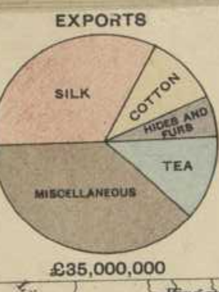

NORTH SEA
ENGLISH CHANNEL
BAY OF BISCAY
IRELAND
HOLLAND
GERMANY
FRANCE
SPAIN
AUSTRIA
HUNGARY
RUSSIA
BOSNIA
SERVIA
SWEDEN
LONDON
PARIS
BERLIN
VIENNA
HAMBURG
COPENHAGEN
AMSTERDAM
ROTTERDAM
ANTWERP
BRUSSELS
LEIPZIG
MAGDEBURG
BRESLAU
PRAGUE
MUNICH
WARSAW
KÖNIGSBERG
BUDA PEST
TRIESTE
VENICE
TURIN
GENOA
FLORENCE
ROME
LYONS
MARSEILLES
BORDEAUX
NANTES
ORLEANS
TOULOUSE
BARCELONA
SARAGOSSA
BELGRADE
English Miles
Meridian of 0 Greenwich
EXPLANATION OF SIGNS
TEXTILES
Cotton Goods
Woollen Goods
Linen and Jute
Silk Goods
Leather
Metal Work
Machinery
Shipbuilding
Earthenware
Paper Making
Chemicals
Railways, Main Lines
Other Lines
Steamship Routes, with distances in Nautical Miles
John Bartholomew & Co., Edin.r

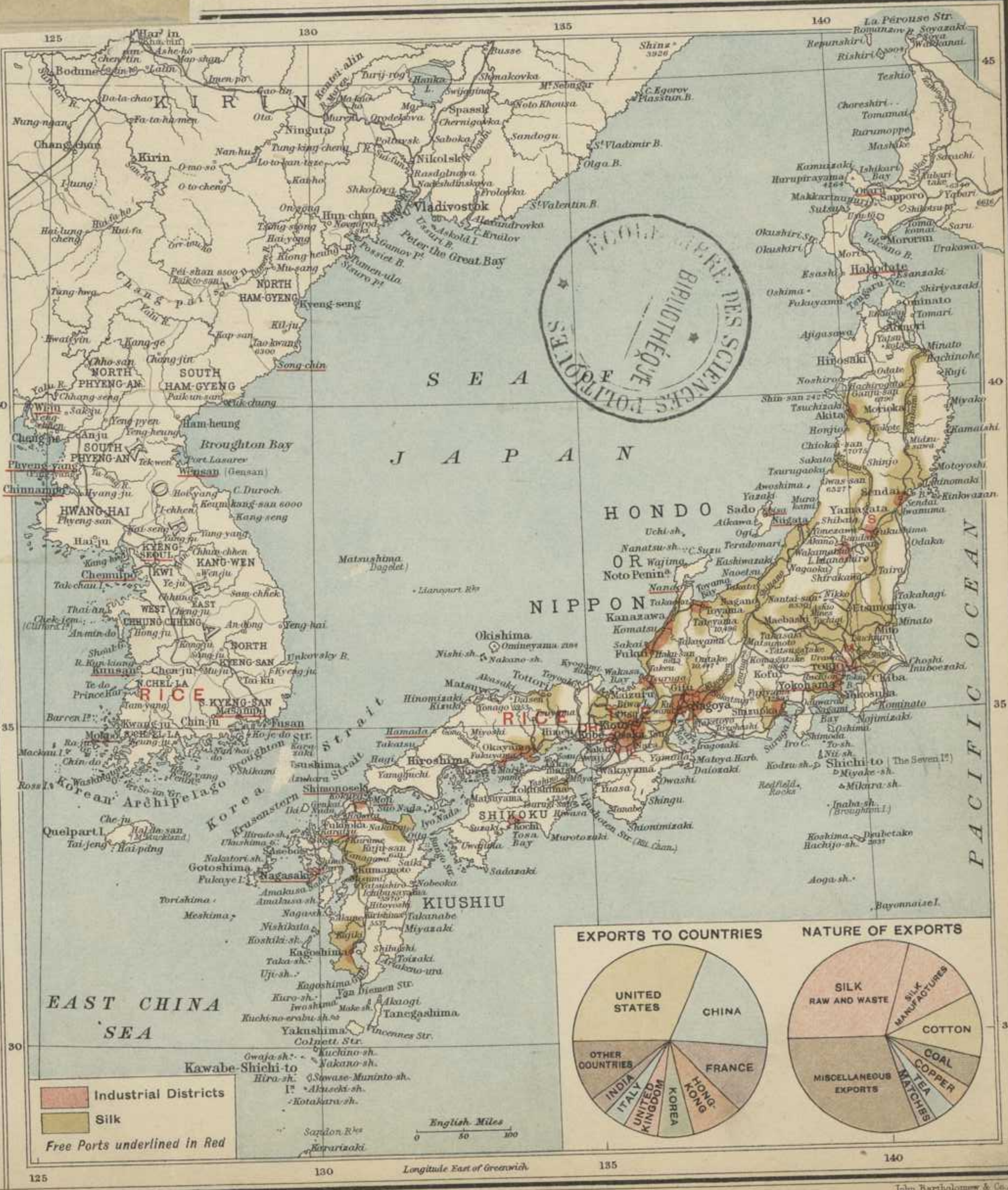
# AGRICULTURAL INDIA INDUSTRIAL

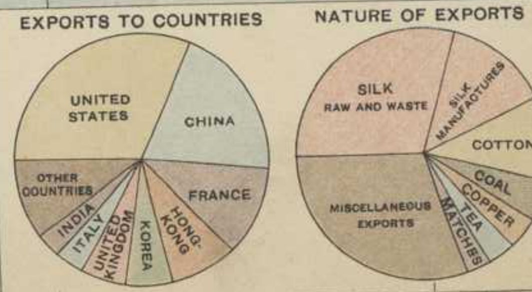


# JAPAN



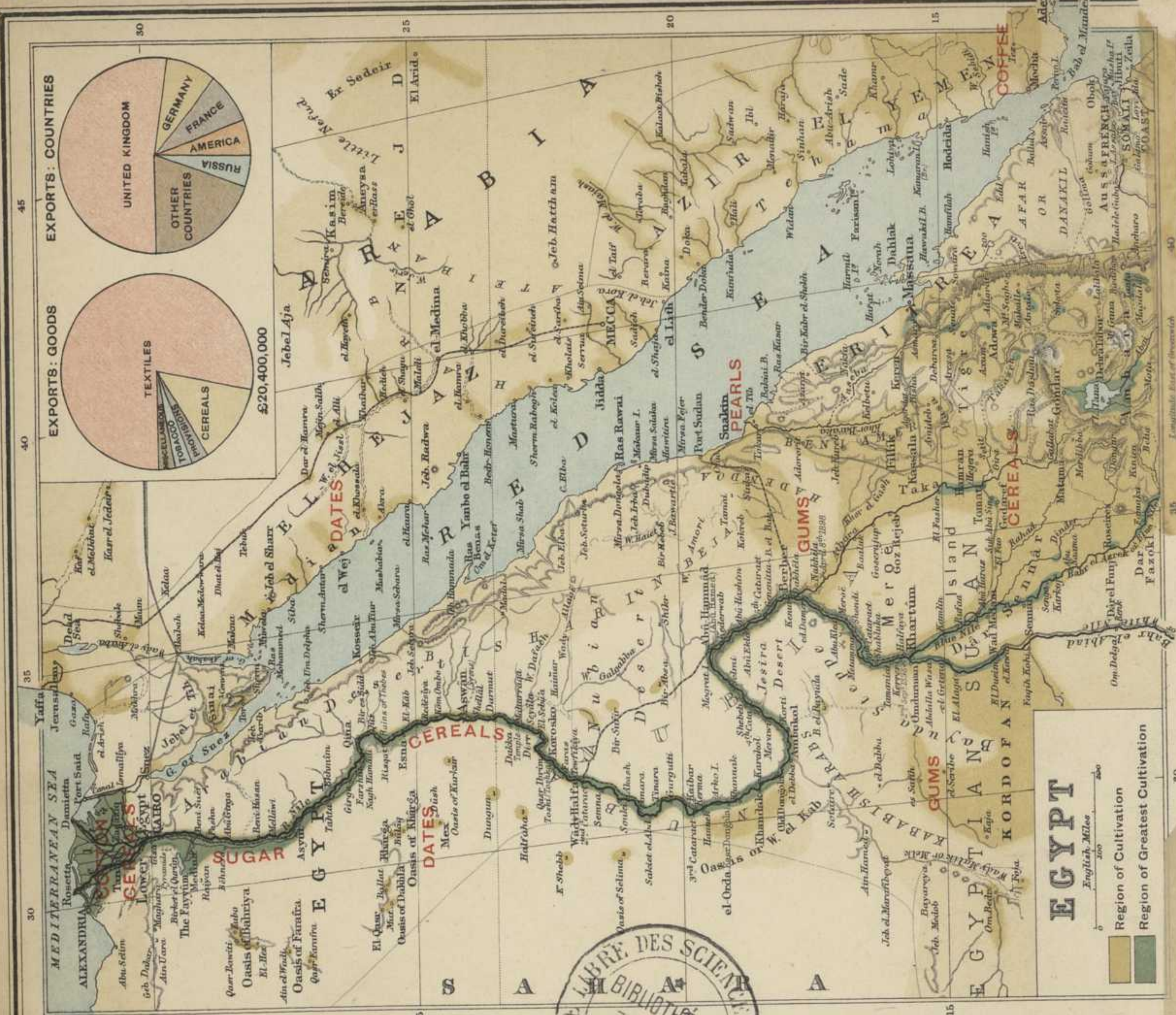



The letters at the manufacturing districts indicate the nature of the chief industries. C Cotton. Ch China-ware. I Iron-work. L Lacquer-work. M Metal-work. S Silk. So Soap.

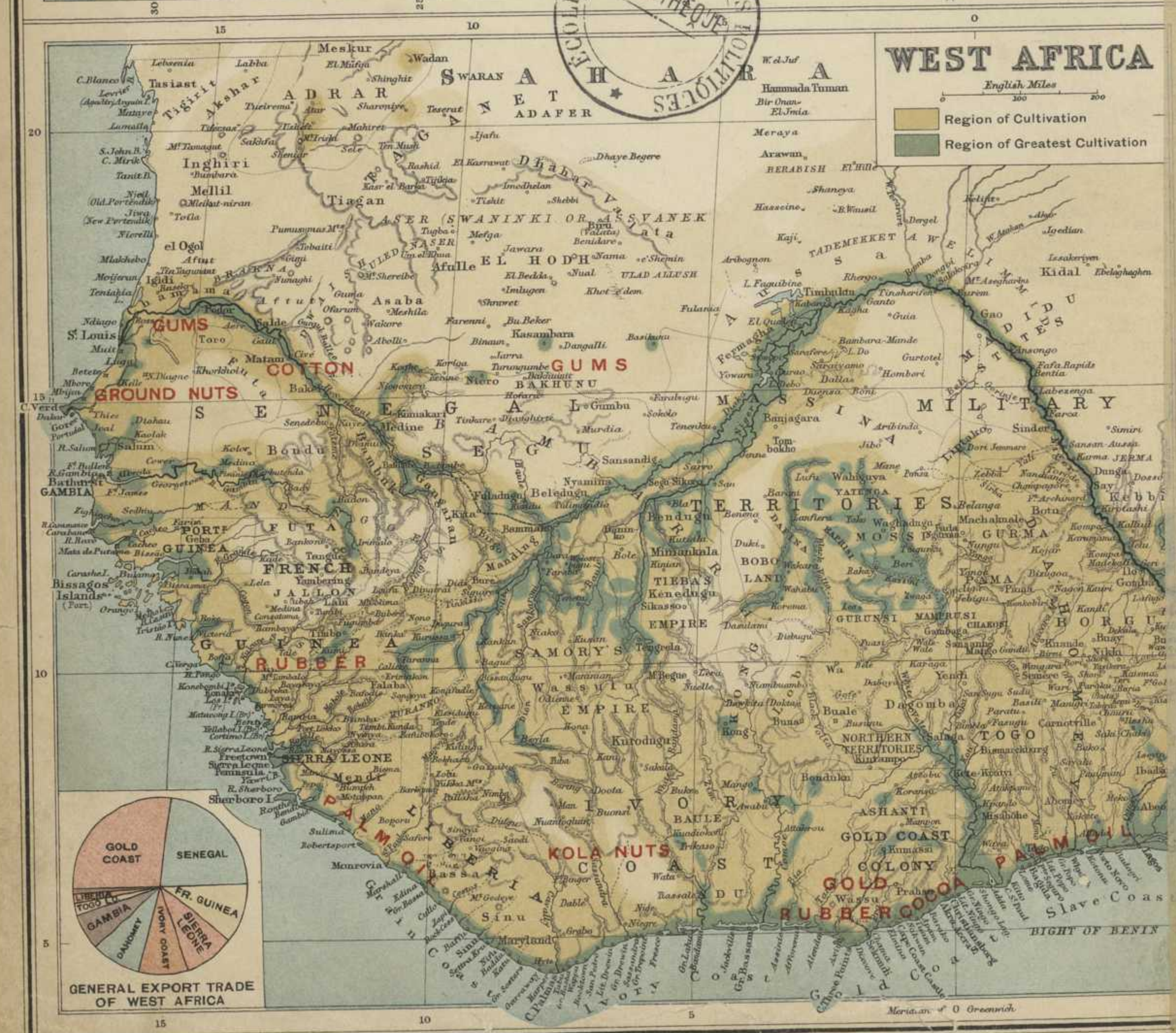
*The Principal Products are specially mapped under their own headings—see list of Maps.*

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SIBERIA
MONGOLIA
CHINA
JAPAN
INDIA
MANCHURIA
TIBET
EAST TURKISTAN
AFGHANISTAN
BALUCHISTAN
BURMA
SIAM
CAMBODIA
CEYLON
BORNEO
PHILIPPINE ISLANDS (United States)
SAKHALIN OR KARAFUTO
GEN<sup>L</sup> GOV<sup>T</sup> OF THE AMUR
GEN<sup>L</sup> GOV<sup>T</sup> OF THE STEPPES
GEN<sup>L</sup> GOV<sup>T</sup> OF TURKISTAN
CENTRAL ASIA
Steppes of the
Kirghiz Kazaks
SEA OF OKHOTSK
SEA OF JAPAN
YELLOW SEA
EASTERN SEA
SOUTH CHINA SEA
BAY OF BENGAL
ARABIAN SEA
PACIFIC OCEAN
Magelhaes Archipelago
Transbaikalia
Amur Prov.
Lake Baikal
Irkutsk
Tomsk
Akmolinsk
Semipalatinsk
Bokhara
Kashmir
Punjab
Rajputana
Bengal
Bombay
Madras
Hyderabad
Luzon
Mindanao
Formosa
Hainan
Hong-kong (Brit.)
Shanghai
Nagasaki
Yokohama
NOTE TO VEGETATION COLOURING
Tropical Forests
Forests, chiefly coniferous
Trees, Grassland & Cultivation
Prairies and Steppes
Barren Desert
High Mountain Flora
VERTICAL DISTRIBUTION OF VEGETATION
HIMALAYAS
THIAN SHAN
KUEN LUN
ALTAI
Siberian Tundra
Savanna
Siberian Forest
Temperate Forest
Sub-Tropical Savanna
Alpine Region
PLAINS OF INDIA
NOTE TO COMMERCIAL FEATURES
Principal Railways
,, Canals
Ocean Steamer Routes with distances in nautical miles
Navigable Rivers
Submarine Cables & Telegraphs
Deep Sea soundings in fathoms
British Consul General
,, Consul
,, Vice-Consul or Agent
John Bartholomew & Co., Edin<sup>r</sup>





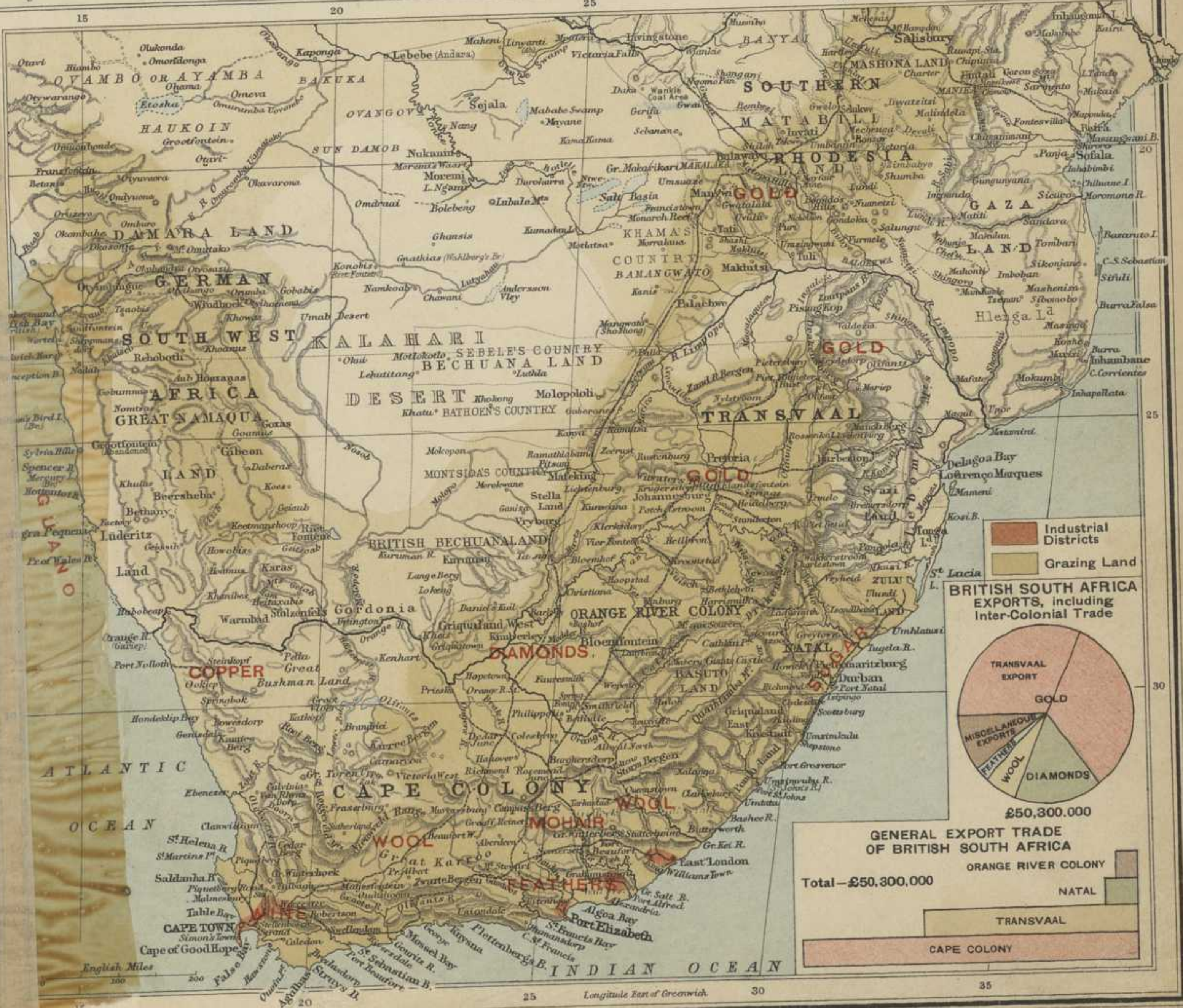






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# AFRICA – GENERAL COMMERCIAL CHART

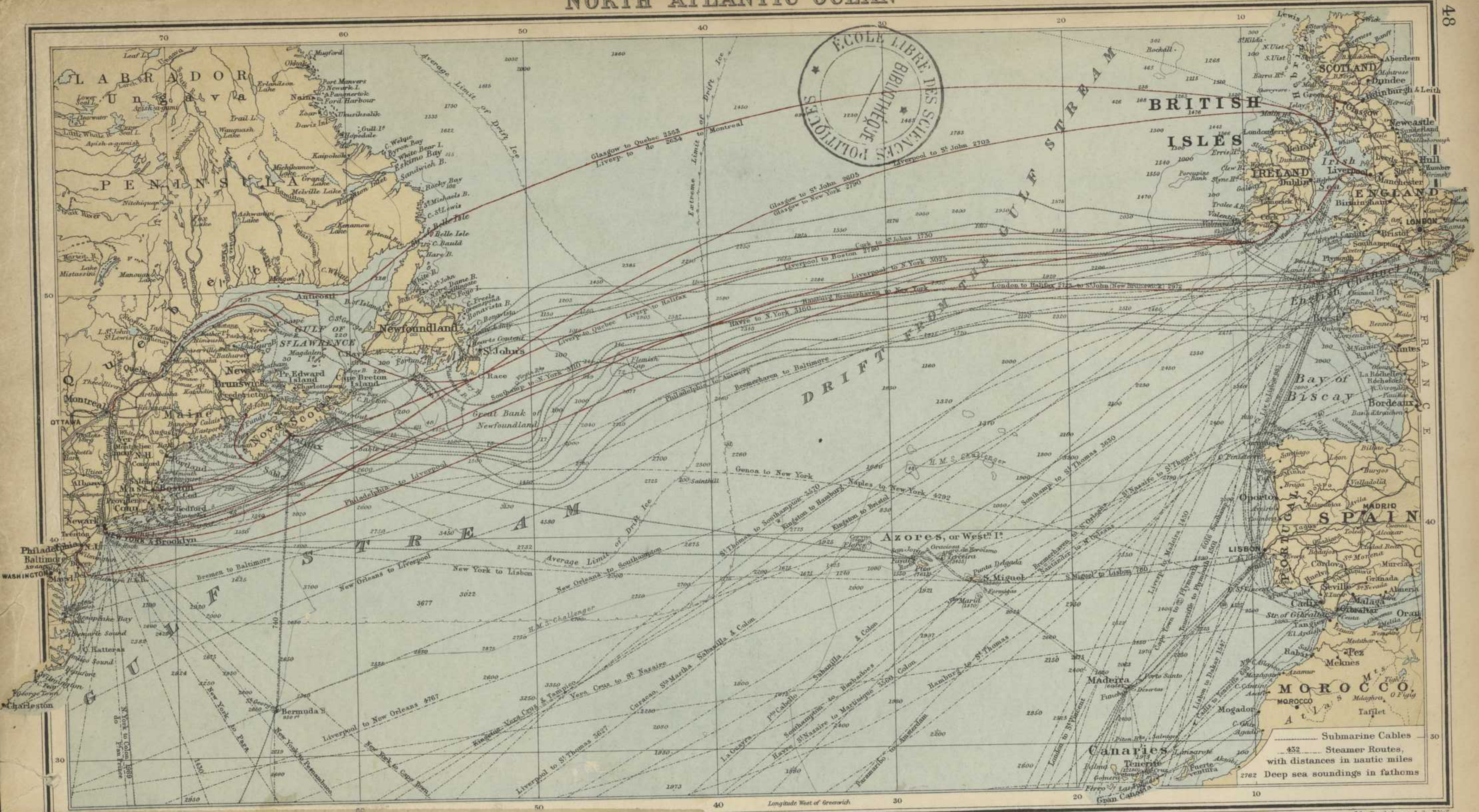
VERTICAL DISTRIBUTION OF VEGETATION

NOTE TO VEGETATION COLOURING
- Tropical Forests
- Forests
- Trees, Grassland & Cultivation
- Prairies and Steppes
- Barren Desert
- High Mountain Flora

NOTE TO COMMERCIAL FEATURES
- Principal Railways
- „ Canals
- Ocean Steamer Routes with distances in nautical miles
- Navigable Rivers
- Submarine Cables & Telegraphs
- Deep Sea soundings in fathoms
- British Consul General
- „ Consul
- „ Vice-Consul or Agent



# NORTH ATLANTIC OCEAN



# DOMINION OF CANADA




The Letters at the manufacturing towns indicate the nature of the Chief industries. C Cotton. I Iron Wares. L Leather. W Wool
*The Principal Products are specially mapped under their own headings—see list of Maps.*


NOTE TO VEGETATION COLOURING
Tropical Forests
Forests, chiefly coniferous
Trees, Grassland & Cultivation
Prairies and Steppes
Barren Desert
High Mountain Flora
Tundra or Frozen Soil
NOTE TO COMMERCIAL FEATURES
Principal Railways
,, Canals
4750 Ocean Steamer Routes with distances in nautical miles
Navigable Rivers
Submarine Cables & Telegraphs
1054 4600 Deep Sea soundings in fathoms
British Consul General
,, Consul
,, Vice-Consul or Agent
VERTICAL DISTRIBUTION OF VEGETATION
VANCOUVER I.
CALIFORNIA
Sierra Nevada
NEW MEXICO
KANSAS
MEXICO
Orizaba
Mountain Flora
KLONDIKE
GOLDFIELDS
DOMINION OF CANADA
HUDSON BAY
SOUTHAMPTON ISLAND
Hudson Strait
LABRADOR PENINSULA
Ungava Bay
Newfoundland
GULF OF ST LAWRENCE
British Columbia
Alberta
Saskatchewan
Montana
North Dakota
South Dakota
Minnesota
Wisconsin
Idaho
Oregon
Wyoming
Nevada
Colorado
Arizona
New Mexico
UNITED STATES
Kentucky
Arkansas
Mississippi
Georgia
Florida
New Orleans
San Francisco
Vancouver I.
Queen Charlotte Islands
Sitka
Montreal
Lake Huron
Lower California
MEXICO
GULF OF MEXICO
CUBA
S. DOMINGO
WEST INDIA ISLANDS
CARIBBEAN SEA
CENTRAL AMERICA
PACIFIC OCEAN
ATLANTIC OCEAN
Yokohama to Vancouver 4320
Yokohama to S. Francisco 4750
Bermuda
Acapulco
Revilla Gigedo Is.
John Bartholomew & Co. Edinr.











EXPORTS TO DIFFERENT COUNTRIES




TOTAL ANNUAL EXPORTS OF UNIT… …ES SHOWING NATURE OF TRADE

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COTTON, Unmanufactured, £76,000,000 | COTTON MANUFACTURED £10,000,000 | PROVISIONS, £34,000,000 | BREADSTUFF… £21,000,00… | …& STEEL …7,000,000 | COPPER £17,000,000 | MINERAL OILS £16,000,000 | WOOD £11,000,000 | LIVE STOCK £9,000,000 | LEATHER £7,000,000 | TOBACCO £7,000,000 | OTHER EXPORTS |

TOTAL ANNUAL IMPORTS OF UNITED STATES SHOWING … OF TRADE

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUGAR £19,000,000 | COFFEE £17,000,000 | HIDES & SKINS £13,000,000 | CHEMICALS £13,000,000 | SILK Unmanufactured £12,000,000 | SILK MANUFACTURED £6,000,000 | WOOL £13,000,000 | COTTON £11,000,000 | FIBRES £16,000,000 | RUBBER £10,000,000 | IRON AND STEEL COPP… £13,000… | OTHER IMPORTS |

*N.B.—The Imports Diagram is on the same scale as the Exports.*

IMPORTS FROM DIFFERENT COUNTRIES




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SOUTH AMERICA – GENERAL COMMERCIAL CHART
NORTH ATLANTIC OCEAN
SOUTH ATLANTIC OCEAN
SOUTH PACIFIC OCEAN
CARIBBEAN SEA
BRAZIL
BOLIVIA
PERU
ECUADOR
COLOMBIA
VENEZUELA
ARGENTINA
URUGUAY
CHILE
BRITISH DUTCH FRENCH GUIANA
Equator
Tropic of Capricorn
Cape Verde Is.
Galapagos I.
Arch. de Colon
Falkland Is.
South Georgia
Str. of Magellan
Rio de la Plata
Tierra del Fuego
Cape Horn
Cuba
Jamaica
Valparaiso
Rio de Janeiro
Montevideo
Callao
VERTICAL DISTRIBUTION OF VEGETATION
ANDES OF THE EQUATOR
SELVAS OF BRAZIL
ANDES OF TIERRA DEL FUEGO
Temperate Region
Sub-Tropical Region
Tropical Region of Forest
NOTE TO VEGETATION COLOURING
Tropical Forests
Forests, chiefly coniferous
Trees, Grassland & Cultivation
Prairies and Steppes
Barren Desert
High Mountain Flora
NOTE TO COMMERCIAL FEATURES
Principal Railways
" Canals
4750 Ocean Steamer Routes with distances in nautical miles
Navigable Rivers
Submarine Cables & Telegraphs
1054 4600 Deep Sea soundings in fathoms
British Consul General
" Consul
" Vice-Consul or Agent
Longitude West of Greenwich
John Bartholomew & Co. Edin.

# WEST INDIES & CENTRAL AMERICA






The Principal Products are specially mapped unde... ...adings—see list ...

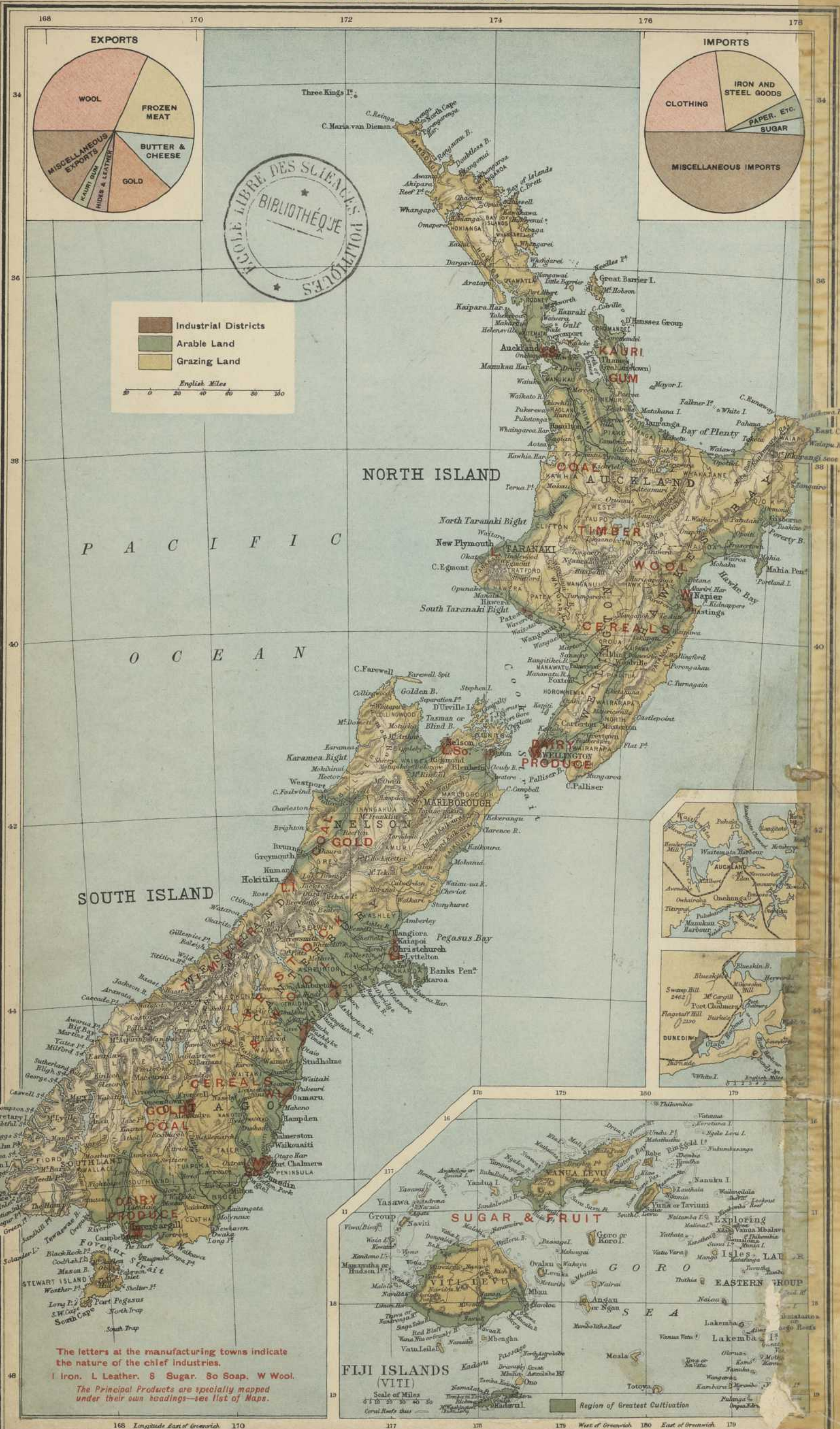
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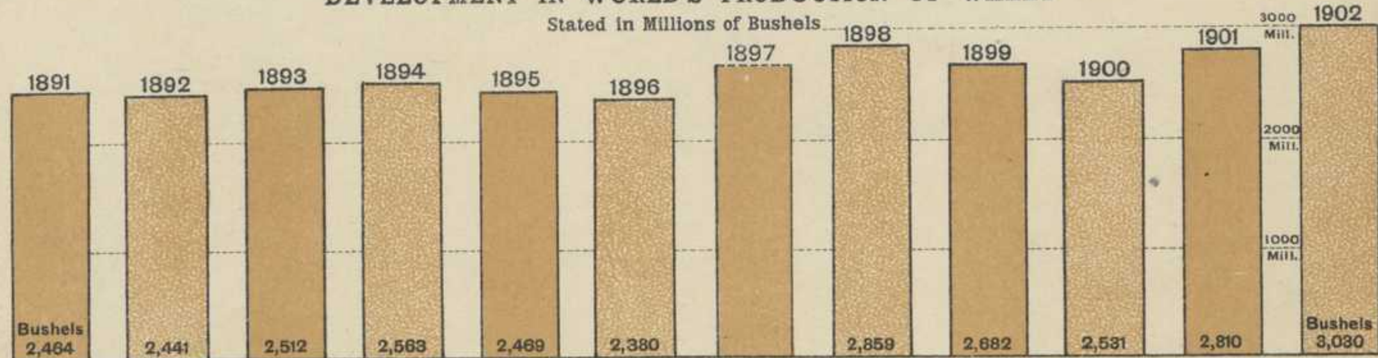

The Letters at the manufacturing districts indicate the nature of the chief industries. I Iron Wares. L Leather. M Machinery. S Sugar. W Wood. Wi Wine.
*The Principal Products are specially mapped under their own headings—see list of Maps.*


PHILIPPINE ISLANDS (United States)
CAROLINE ISLANDS (German)
MARSHALL ISLANDS
GILBERT ISLANDS (British)
SIAM
CAMBODIA
SOUTH CHINA SEA
BORNEO
CELEBES
SUMATRA
JAVA SEA
JAVA
BANDA SEA
ARAFURA SEA
PAPUA OR NEW GUINEA
BISMARCK ARCH.
SOLOMON ISLANDS
SANTA CRUZ Is
NEW HEBRIDES
NEW CALEDONIA (French)
FIJI ISLANDS
TONGA OR FRIENDLY Is
SAMOA OR NAVIGATOR Is
CORAL SEA
GULF OF CARPENTARIA
INDIAN OCEAN
PACIFIC OCEAN
Equator
Tropic of Capricorn
AUSTRALIA
WESTERN AUSTRALIA
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
TASMANIA
GREAT AUSTRALIAN BIGHT
Great Sandy Desert
Great Victoria Desert
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND
Chatham Is
Kermadec Is
Plymouth to Adelaide
NOTE TO VEGETATION COLOURING
Tropical Forests
Forests
Trees, Grassland & Cultivation
Prairies and Steppes
Barren Desert
High Mountain Flora
NOTE TO COMMERCIAL FEATURES
Principal Railways
" Canals
4750 Ocean Steamer Routes with distances in nautical miles
Navigable Rivers
Submarine Cables & Telegraphs
1054 4600 Deep Sea soundings in fathoms
British Consul General
" Consul
" Vice-Consul or Agent
VERTICAL DISTRIBUTION OF VEGETATION
AUSTRALIAN ALPS
Kosciusko 7,350
Snow
Alpine Flora
Upper Forest Region
with Snow for greater part of year
Eucalyptus Forest
Murray R.
Scrub Region
Lower Forest Region - with Tree Ferns
NEW ZEALAND ALPS
Mt Cook 12,349
Perennial Ice & Snow
Limit of perpetual Snow
Alpine Region
Snow at times & places
Upper Forest Region
Forest Region
Kauri and other Pines, Beech and Tree Ferns
Longitude East of Greenwich
Longitude West of Greenwich
John Bartholomew & Co. Edinr

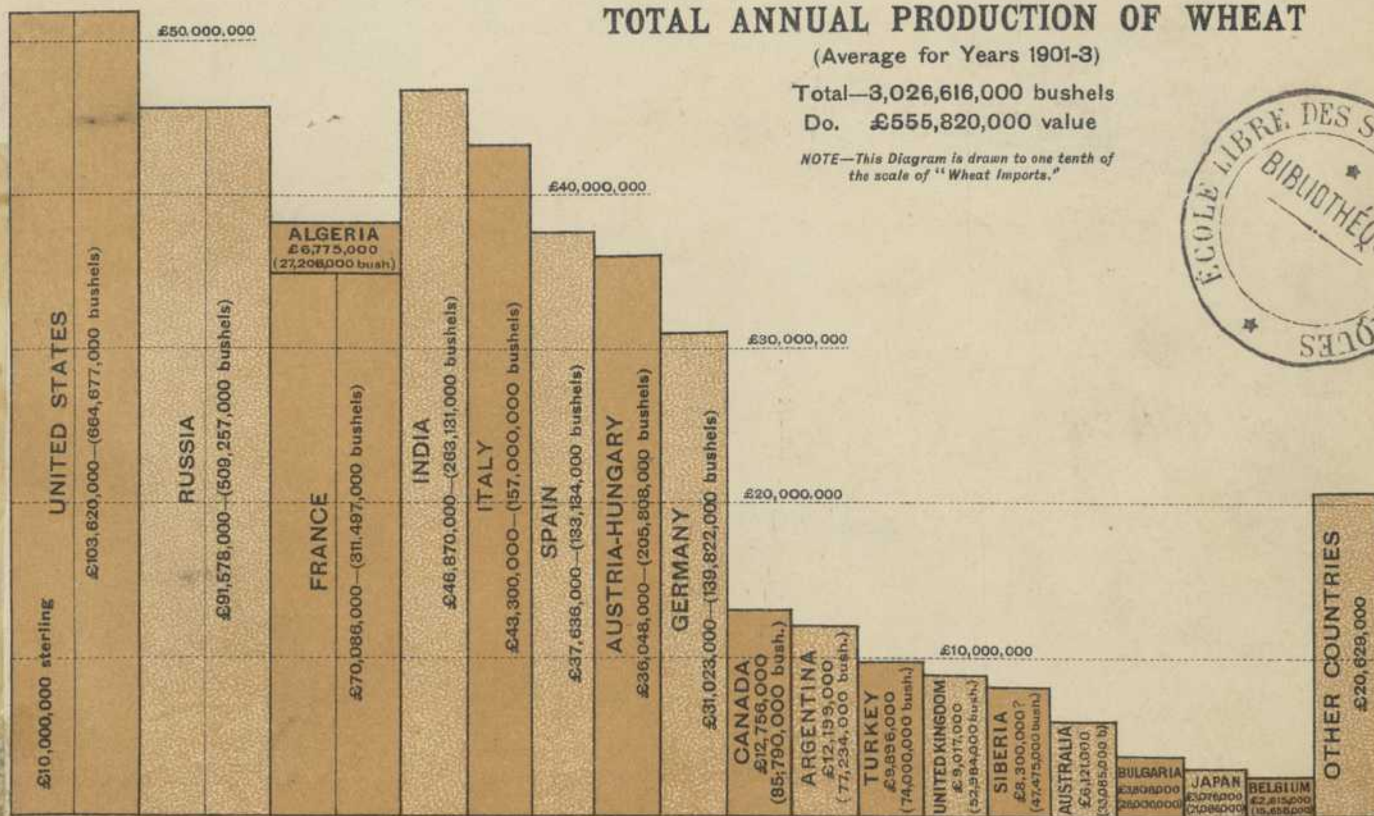

EXPORTS
WOOL
FROZEN MEAT
BUTTER & CHEESE
GOLD
HIDES & LEATHER
KAURI GUM
MISCELLANEOUS EXPORTS
IMPORTS
CLOTHING
IRON AND STEEL GOODS
PAPER, ETC.
SUGAR
MISCELLANEOUS IMPORTS
Industrial Districts
Arable Land
Grazing Land
English Miles
NORTH ISLAND
SOUTH ISLAND
PACIFIC
OCEAN
KAURI GUM
COAL
AUCKLAND
TIMBER
WOOL
CEREALS
DAIRY PRODUCE
TARANAKI
WELLINGTON
NELSON
GOLD
MARLBOROUGH
CANTERBURY
WESTLAND
OTAGO
SOUTHLAND
Three Kings Is.
C. Maria van Diemen
Bay of Islands
Great Barrier I.
Hauraki Gulf
Auckland
Bay of Plenty
North Taranaki Bight
New Plymouth
C. Egmont
South Taranaki Bight
Hawke Bay
Napier
Hastings
Wanganui
Palmerston North
Wellington
C. Palliser
C. Farewell
Golden B.
Tasman or Blind B.
Nelson
Karamea Bight
Westport
Greymouth
Hokitika
Pegasus Bay
Christchurch
Lyttelton
Banks Pen.
Timaru
Oamaru
Dunedin
Port Chalmers
Invercargill
Foveaux Strait
STEWART ISLAND
South Cape
FIJI ISLANDS (VITI)
Scale of Miles
VANUA LEVU
VITI LEVU
SUGAR & FRUIT
KORO SEA
EASTERN GROUP
Region of Greatest Cultivation
Waitemata Harbour
AUCKLAND
Onehunga
Manukau Harbour
DUNEDIN
Otago Harbour
Port Chalmers
Longitude East of Greenwich
West of Greenwich
East of Greenwich
The letters at the manufacturing towns indicate the nature of the chief industries.
I Iron. L Leather. S Sugar. So Soap. W Wool.
The Principal Products are specially mapped under their own headings—see list of Maps.
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# WHEAT

**General Summary.**—Common wheat, *Triticum vulgare* or *sativum*, is the most valuable of the cereals. It has been grown from prehistoric times, having been found in the lake dwellings of Europe and the tombs of Egypt, and it was cultivated in China for several centuries before the Christian era. About 1530 it was introduced by the Spaniards into Mexico, and was planted in New England and Virginia early in the 17th century. In Europe it extends, in Scandinavia and Russia, to a little beyond the 65th parallel of N. lat., its limit running not far from the May isotherm of 48° F. Within the tropics it can thrive only at considerable altitudes. Wheat requires a rich soil, but can grow where the rainfall is comparatively small. Continued wet weather is fatal to it, but short periods of heavy rain are not injurious. There are many varieties of wheat, but it is very doubtful if any are distinct species. There are awned or bearded wheats and wheats without awns, the former being generally winter wheats, *i.e.*, sown in autumn, and the latter spring wheats. Again, there are red and white wheats, the former being more suitable to poor soils, while the latter yield flour of better quality. Mummy wheat (*T. compositum*), so called because it was erroneously supposed to have been produced from grains found in Egyptian tombs, is a variety with loosely formed ears; Polish wheat (*T. Polonicum*) has very long ears and grains; spelt (*T. spelta*) is a hardy kind cultivated in the Alps and several parts of central Europe. Hard wheats are used in making macaroni and other fancy foods. American wheats are hard, yield little bran, and are rich in carbo-hydrates (starch, &c.), of which they contain 72 per cent. against 68 in English wheat; they have a large proportion of oil, but are deficient in albuminoids, as are also Egyptian and Australian wheats The better qualities of grain yield 80 per cent. of flour, or even more; the inferior only 54 to 68 per cent. The yield per acre is greatest in the highly cultivated lands of Europe, being about 30 bushels in the United Kingdom, 34½ in Belgium, and 27 in Germany, whereas it is only 13.5 in the United States. Wheat bread has come into general use only within the last century. In 1689 only about 14 million bushels of wheat were produced, being about 3 bushels per head, and in the early years of George III. the consumption was only some 4½ bushels. At this period wheat was exported in years of good harvests, and it was only from 1788 that the imports permanently exceeded the exports. During the following years the cultivation was much extended, and in 1828 the quantity had risen to 100 million bushels, a very moderate amount, but apparently nearly sufficient for home consumption, for, in the good years of 1831-6, importation almost ceased, and the price was lower than it had been since 1776. During the last thirty years the large imports of foreign corn at low prices have led to a reduction of the acreage under wheat by considerably over a third.

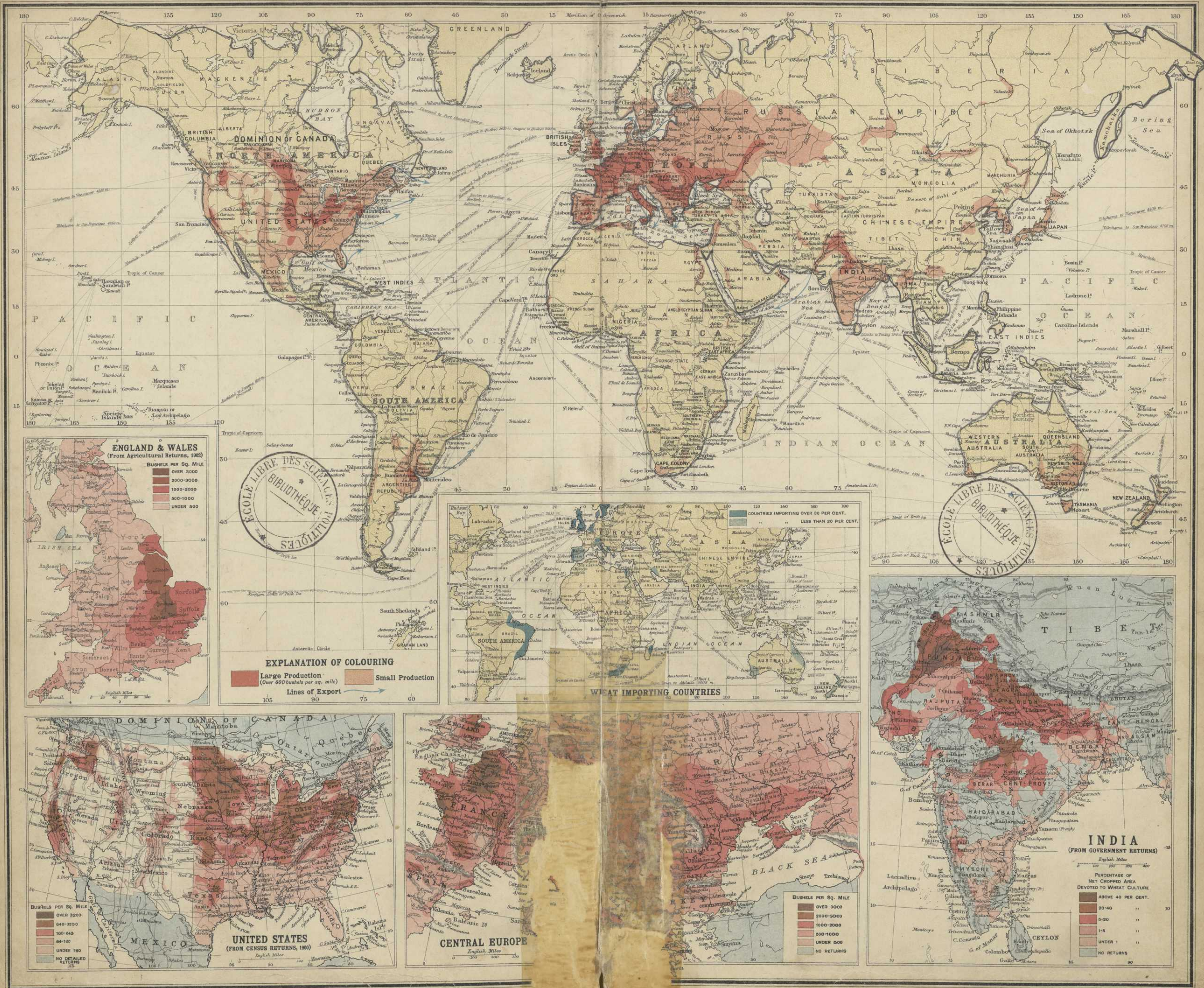



At first sight there appears to have been no striking increase in the production during the eleven years. It will be found, however, that the average annual production during the last five years is fully 11 per cent. greater than the average for the first five years, which is, perhaps, more than might be expected in connection with the fall in price.





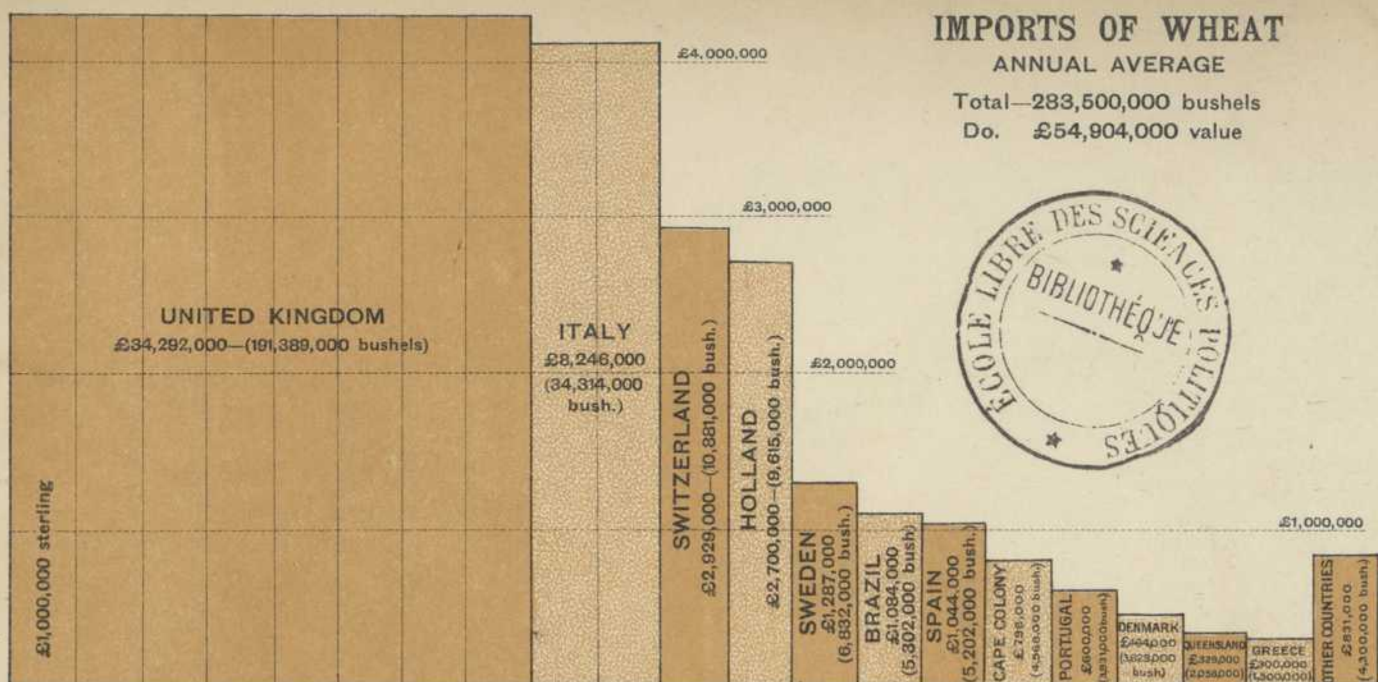

The United States may be expected to keep the lead for many years to come, but its rapidly increasing population will in time put a check on exportation. Russia, though an exporting country, does not actually produce more than is needed by the population. Canada and Argentina are the chief countries where a considerable increase may be looked for, and India, as irrigation is extended, may enlarge its cultivation.







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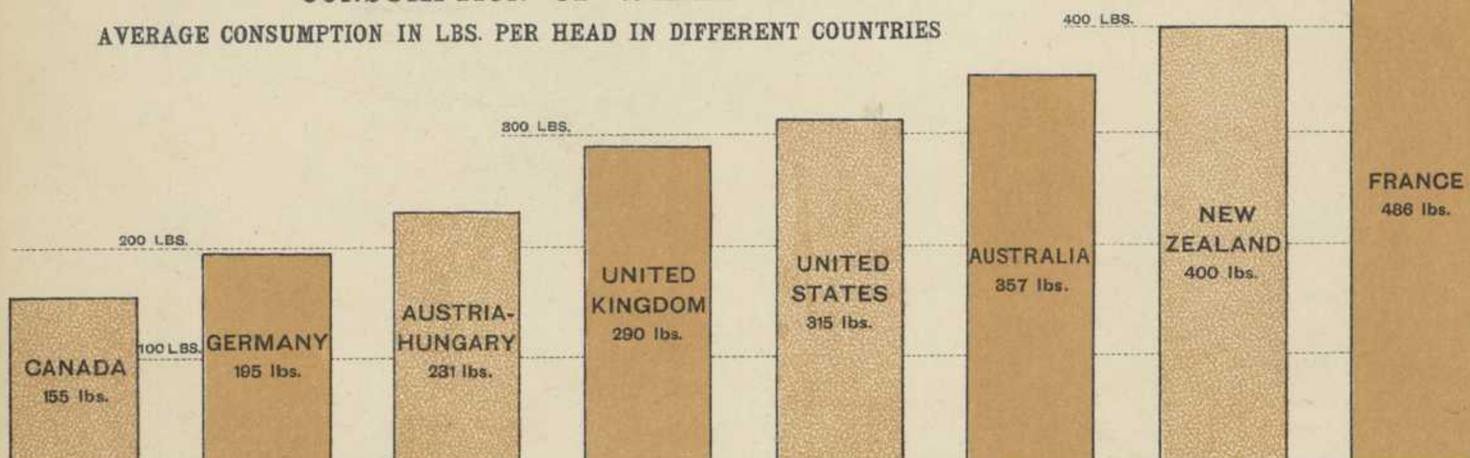




The United Kingdom and Italy are the most conspicuous importers of wheat. If, however, the quantity imported per head of population be estimated, Switzerland, Holland, and Sweden follow the United Kingdom, and Italy takes the fifth place. France does not appear in this diagram, its net imports being small and its population practically stationary.

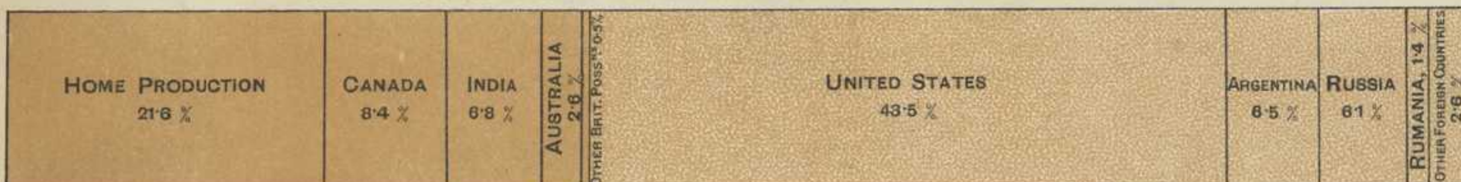
## CONSUMPTION OF WHEAT

### AVERAGE CONSUMPTION IN LBS. PER HEAD IN DIFFERENT COUNTRIES



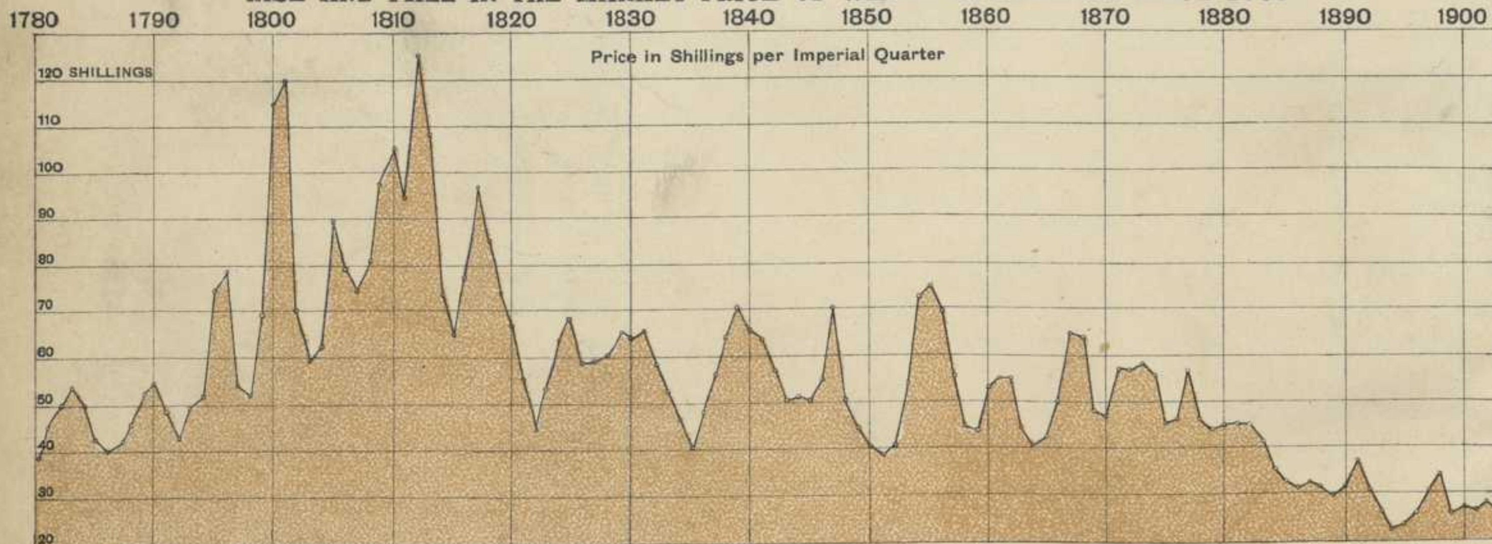

It is well known that more bread is eaten on the continent than in the United Kingdom. France is the largest consumer of all, partly, perhaps, because it manufactures considerable quantities of macaroni, pastes, and other fancy articles. In Germany and Austria the consumption is small because rye and other grains are also used as breadstuffs. The consumption of Australia and New Zealand is not easily accounted for.

## CHIEF SOURCES OF BRITISH SUPPLY OF WHEAT (Average, 1901-3)




In the sixties of the 18th century the home production of the United Kingdom sufficed for the consumption and left about 300,000 quarters for export, and though from 1788 the imports permanently exceeded the exports, they were very small in good years until nearly 1840. The percentages for the countries furnishing the supply have changed considerably during the last 40 years. The United States took the lead even in 1860, but contributed only 29 per cent. of the imports (about 59 mill. bus.), while Russia sent nearly 18 per cent. Prussia and France supplied about 15 per cent. each. Canada forwarded 4 per cent., but India and Australia do not appear in the returns.

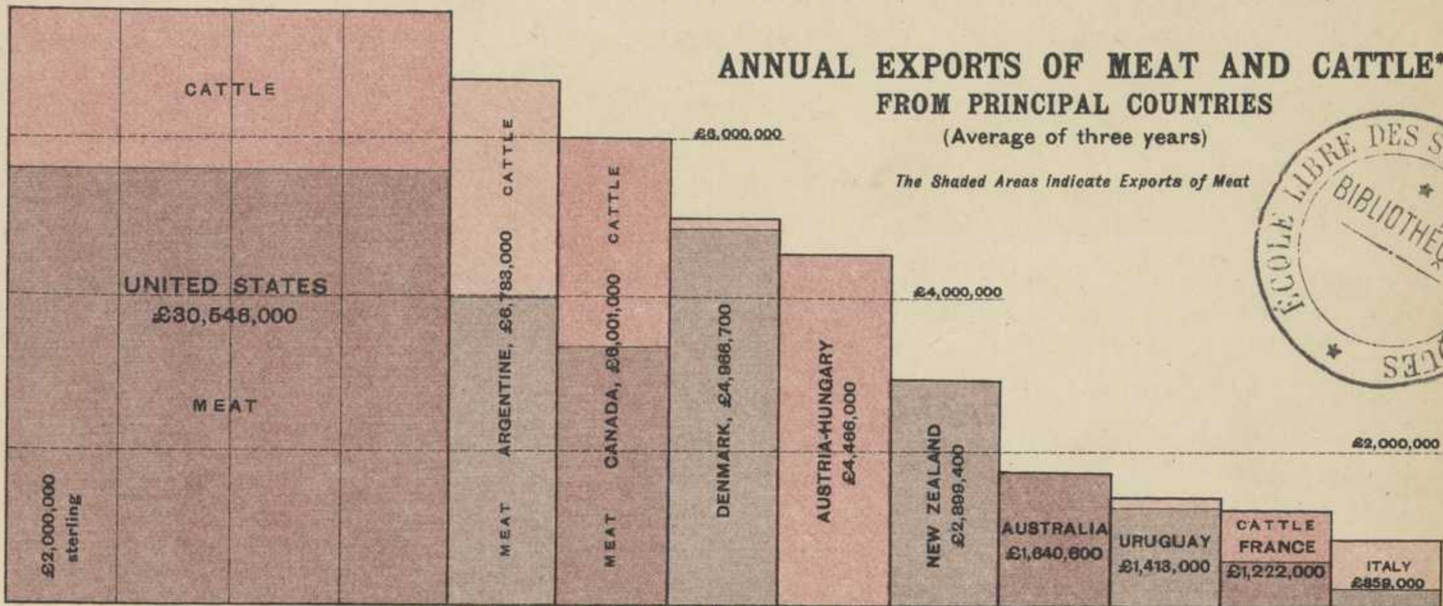
## RISE AND FALL IN THE MARKET PRICE OF WHEAT IN ENGLAND SINCE 1780




During the earlier years to which this diagram refers the import of corn was controlled by duties, but these had nothing to do with the high prices prevailing between 1800 and 1813, for when the price rose above 66 sh. only a nominal duty of 6d. per qr. was imposed. The causes were the difficulty of importation and the depreciation of the currency during the Napoleonic wars, combined with several bad harvests at home, which in 1812 brought up the price to its maximum, 126½ sh. The modification of the corn laws in 1843 and their abolition in 1849, are indicated by a fall in the line of prices, which, however, soon rises again, attaining 74⅗ in 1855 during the Crimean War. At that time the consumption did not very greatly exceed the home production in good years, and the seasons had more effect than duties on the price. Since 1870 increased production abroad and greater facilities of transport have reduced the price by about half.

# MEAT.

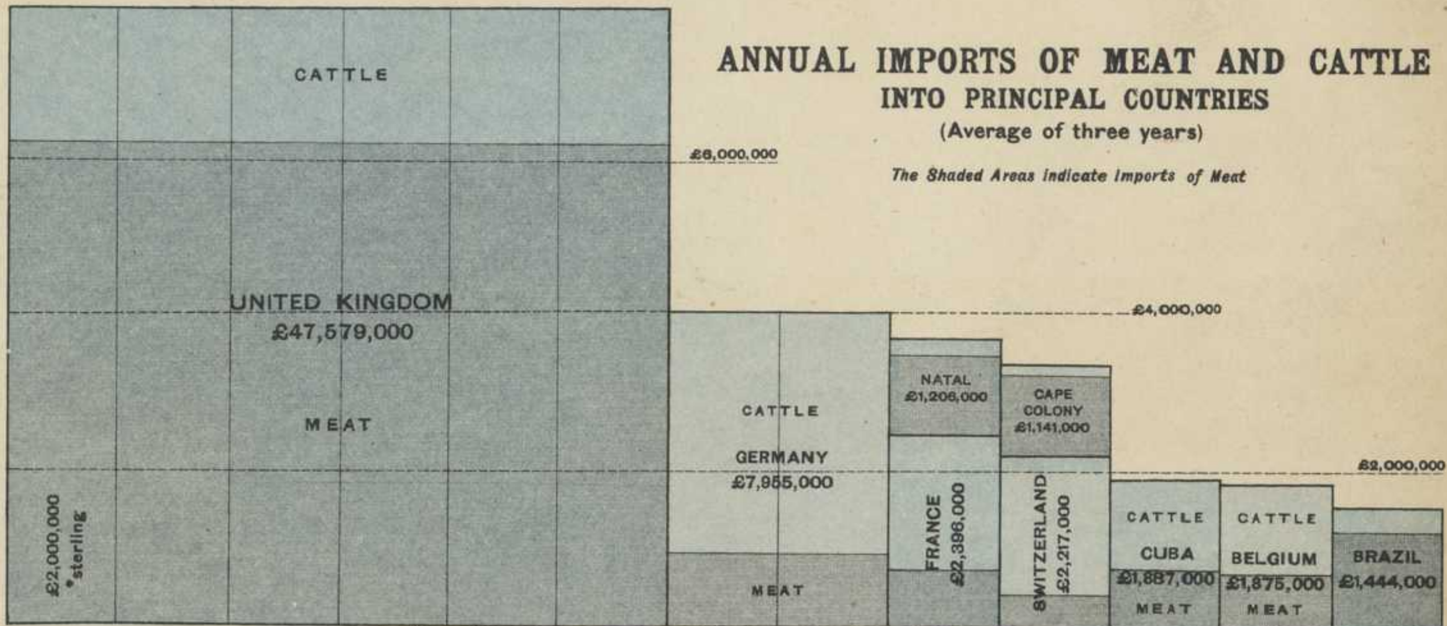
**General Summary**.—There has been a certain amount of trade in live animals and meat for a comparatively long period. The importation of cattle from Ireland was prohibited as long ago as 1664, and salt meat was exported in small quantities from Ireland and North America in the latter part of the 18th century. The trade was then, however, insignificant, and the cattle were lean cattle imported for feeding, as was the case in Holland. Last century, with the rapidly increasing population of European countries and more rapid means of transport, the traffic in meat and cattle rapidly developed, and especially within the last thirty years owing to the introduction of the refrigerating system. The first shipments of frozen meat from America were made in 1876, and from Australia in 1881. About that time also canning was resorted to on a large scale, and America began to send out canned meat in 1879. Both live animals and meat are now exported from America, Argentina, Canada, etc., in increasing quantities, but the latter in far larger proportion—indeed, the importation of sheep into the United Kingdom has decreased of late years, while that of pigs has ceased (a few were received in 1905). The meat shown in the following diagrams is the flesh of cattle, sheep and pigs, fresh, salted or dried, canned, or converted into sausages, etc., poultry and game, which are rather delicacies than staple articles of food, being as far as possible excluded.





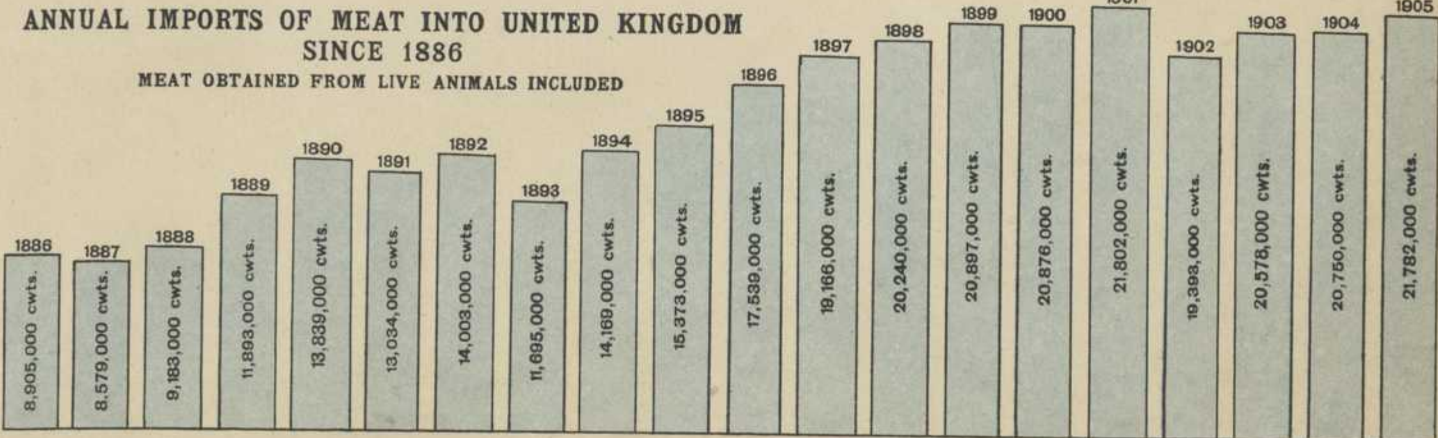
* CATTLE INCLUDES ALL ANIMALS USED FOR FOOD, i.e., CATTLE, SHEEP, AND PIGS

The cattle and meat trade of the United States is enormous, especially meat, the value of the packing house output in 1905 having been more than 187 million pounds sterling, of which, it is seen, only a fraction is exported. The exports of Argentina are rapidly increasing, and frozen meat trade is progressing in Australia and New Zealand. The exports of Denmark are hog products.




NOTE.—THIS DIAGRAM IS DRAWN TO THE SAME SCALE AS THAT SHOWING EXPORTS

Next to the United Kingdom, Germany is the greatest importer, and would probably take a much larger quantity were there no restrictions on importation. Natal and Cape Colony import a large amount in proportion to their white population.




## SOURCES OF BRITISH SUPPLY OF MEAT (Average 1903-5)

PIG MEAT
MUTTON
HOME PRODUCTION, 24,172,000 cwts. or 53·4 %
BEEF

PIG MEAT
UNITED STATES
9,787,968 cwts. or 21·7 %
BEEF

MUTTON
ARGENTINE
3,552,101 cwts. or 7·9%
BEEF

CANADA 2,286,873 C. OR 4·9%
PIG MEAT
BEEF

NEW ZEALAND 1,927,137 C. OR 4·3%
MUTTON
BEEF

DENMARK 1,794,024 C. OR 4·0%
PIG MEAT

HOLLAND, 2·2%

OTHERS, 1·6%

NOTE.—Live Animals are represented by their corresponding weight of meat

# MEAT*- EXPORTING & IMPORTING COUNTRIES



### EXPLANATION OF COLOURING.

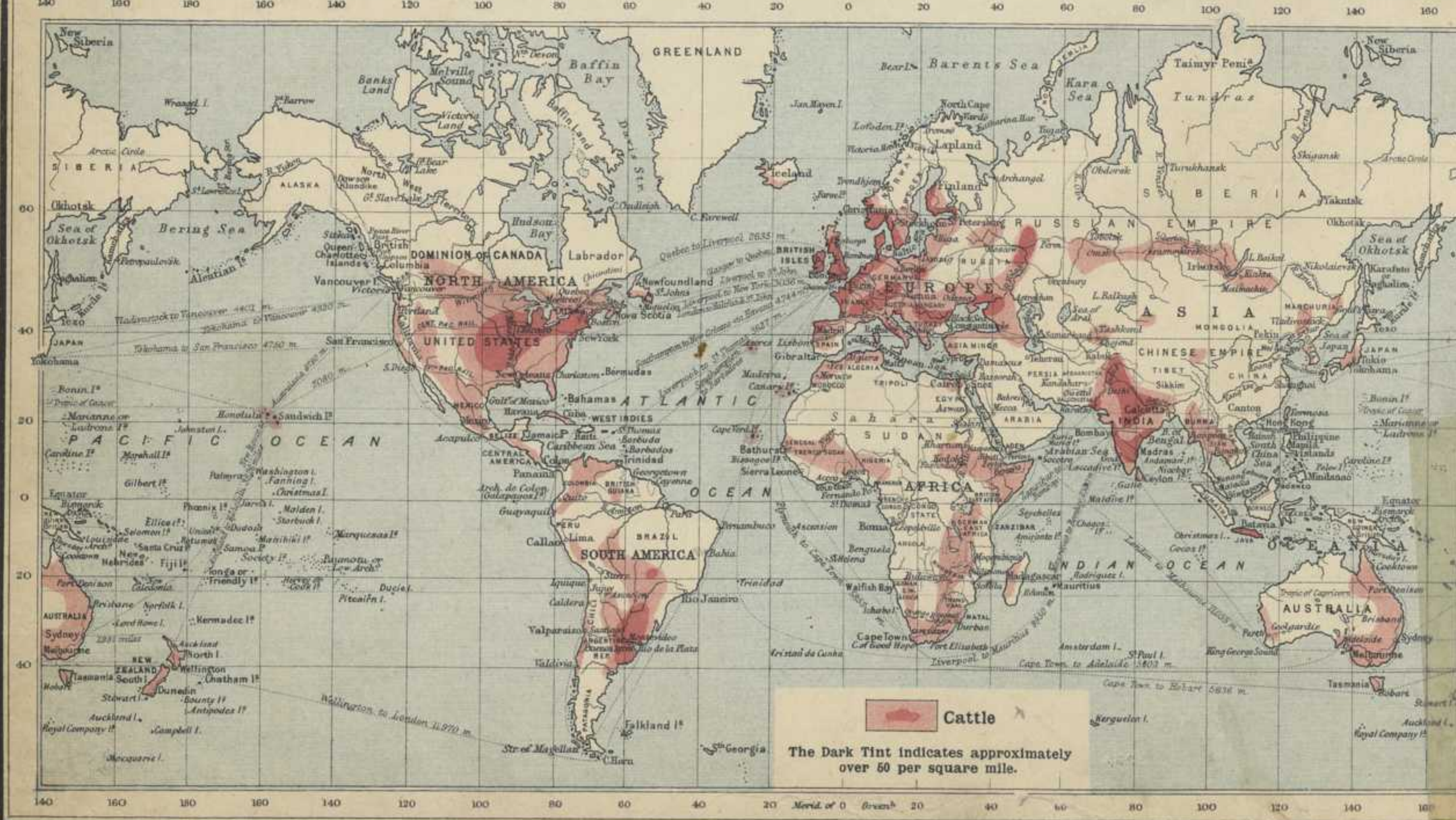
| EXPORTING COUNTRIES | IMPORTING COUNTRIES |
|---|---|
| Over £2 per head | Over £2 per head |
| £1 to £2 ,, | £1 to £2 ,, |
| 2/6 to £1 ,, | 2/6 to £1 ,, |
| Under 2/6 ,, | Under 2/6 ,, |

Chief Lines of Export

*Meat, including Cattle



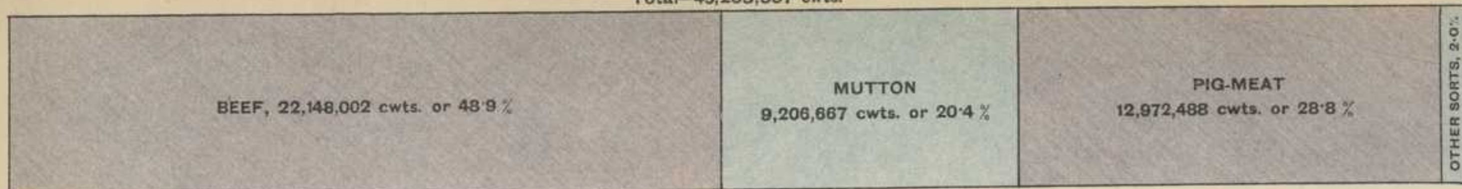






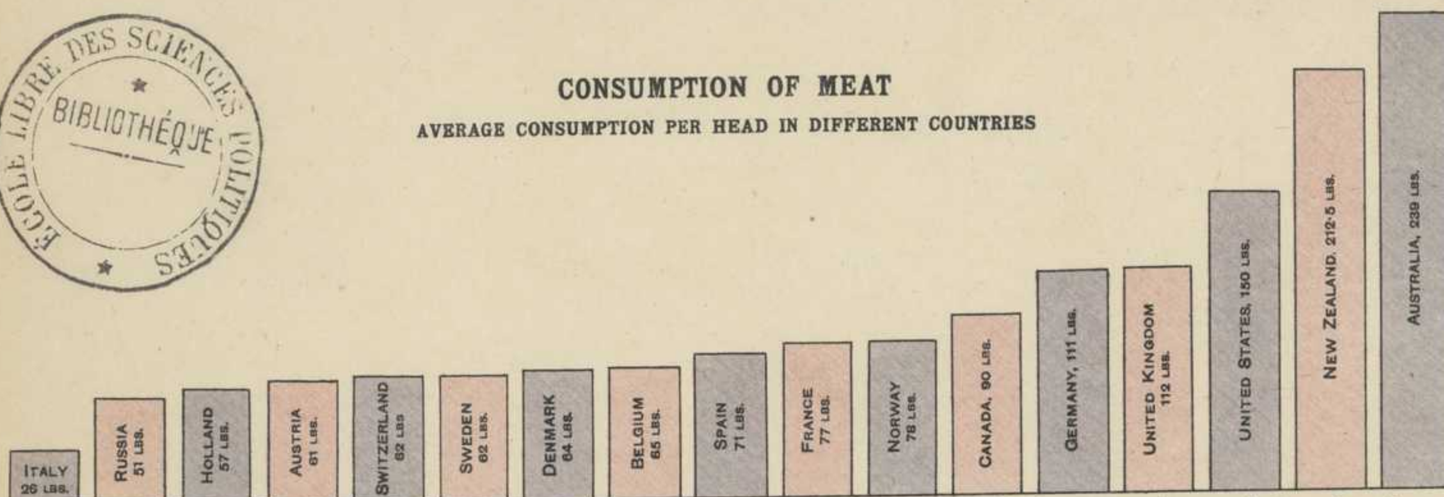


John Bartholomew & Co., Edinr.

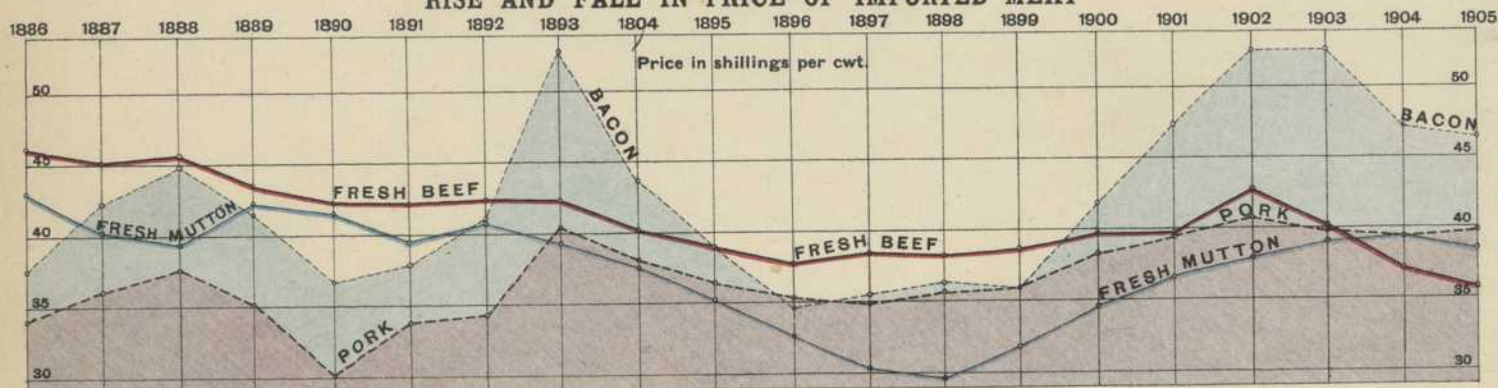






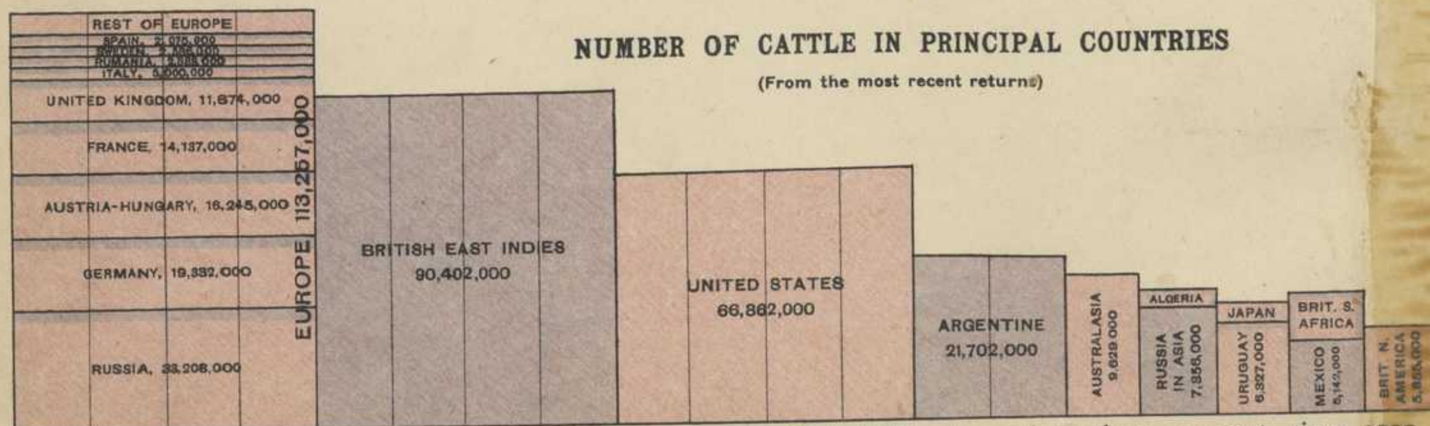



It is incredible that an average Australian eats nearly two-thirds of a pound of meat a day, and therefore the inevitable conclusion is that there, as well as in New Zealand, a large amount is wasted. In the former country more than half the meat consumed is beef, while in New Zealand more mutton is consumed. The consumption of the United Kingdom and Germany is about the same, but whereas in the former beef and mutton constitute more than 60 per cent. of the total, in Germany pig-meat constitutes more than 60 per cent.

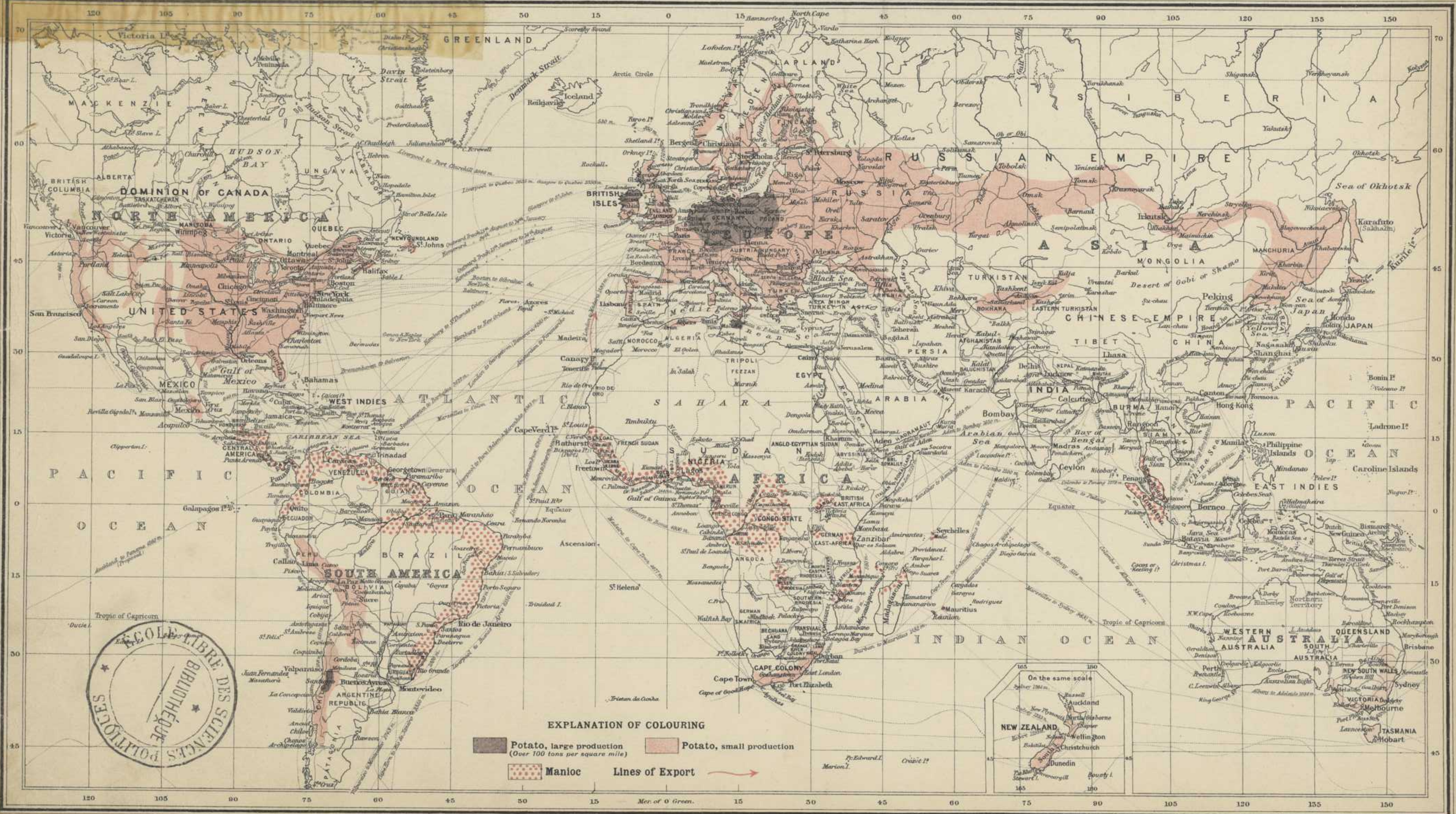



# CATTLE.

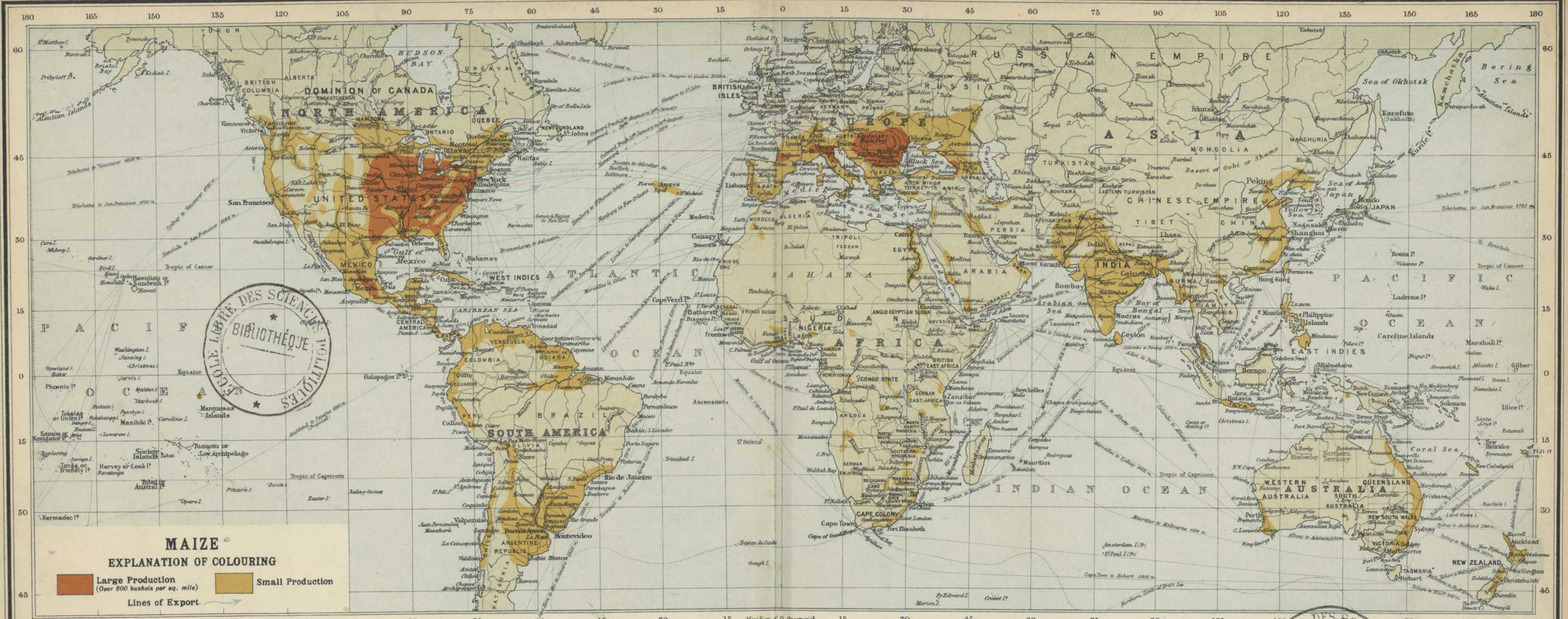
**General Summary.**—The cattle of Europe are modifications of three species, *Bos primigenius*, *B. brachyceros*, and *B. frontosus*. Of the first the Podolian breed in Russia, the Dutch, Belgian and Schleswig-Holstein cattle and the cattle of Northern France and of East England are varieties. The Durham or Shorthorn, the cattle of South Germany, Switzerland and Tyrol belong to the second type, and the third species is also represented in Switzerland and the Tyrol and Salzburg, and by the Polled Aberdeen-Angus and Galloway breeds. The Shorthorn predominates in the British Isles and the United States, being the most generally useful, whether as a milch cow or for fattening. The Ayrshire are good dairy cattle and the West Highland yield excellent beef. Herefords also are good grazing cattle. In the United States and Canada breeds have been introduced from several European countries; the quality is somewhat inferior, but the breeds are in course of improvement. Australian cattle are being improved by the introduction of British breeds. Humped cattle (*Bos zebu*) are kept in India, and the allied *Bos Africanus* is distributed over Africa from Abyssinia to the Cape. Of buffaloes there are two chief species, the Asiatic buffalo (*Bubalus buffelus*) and the Cape buffalo (*B. caffer*). The former is common in India and the South-East of Asia, and is much used for labour in rice fields and other damp lands. The *ghee*, or semifluid butter of India is made from its milk. The animal is also now found in Western Asia and in the Balkan Peninsula. Lastly, in Central Asia (Tibet and Mongolia) the Yak (*Bos grunniens*) takes the place of the ox to a large extent, both as a beast of burden and for food. In the Northern Countries of Europe dairy farming is widespread, whereas in the South, Italy and the Balkan Peninsula, and in many parts of Asia, the ox is a draught animal. In Mexico, many parts of the United States, the Argentine Republic, and Brazil, meat is the chief animal product. Canada and the United States, Mexico, and the Argentine Republic, export live cattle.




There has been a small increase of the number in the United Kingdom of nearly 2 per cent. since 1900. In the United States the increase during the same period has been 53 per cent. In Argentina there has been no enumeration since 1895, and doubtless the figures are much greater than those in the table. For other animals see the List of Commodities; also plate 104.



POTATO & MANIOC
EXPLANATION OF COLOURING
Potato, large production (Over 100 tons per square mile)
Potato, small production
Manioc
Lines of Export
NORTH AMERICA
DOMINION OF CANADA
UNITED STATES
SOUTH AMERICA
EUROPE
RUSSIAN EMPIRE
SIBERIA
ASIA
CHINESE EMPIRE
INDIA
AFRICA
AUSTRALIA
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN
NEW ZEALAND
On the same scale
John Bartholomew & Co. Edin<sup>r</sup>

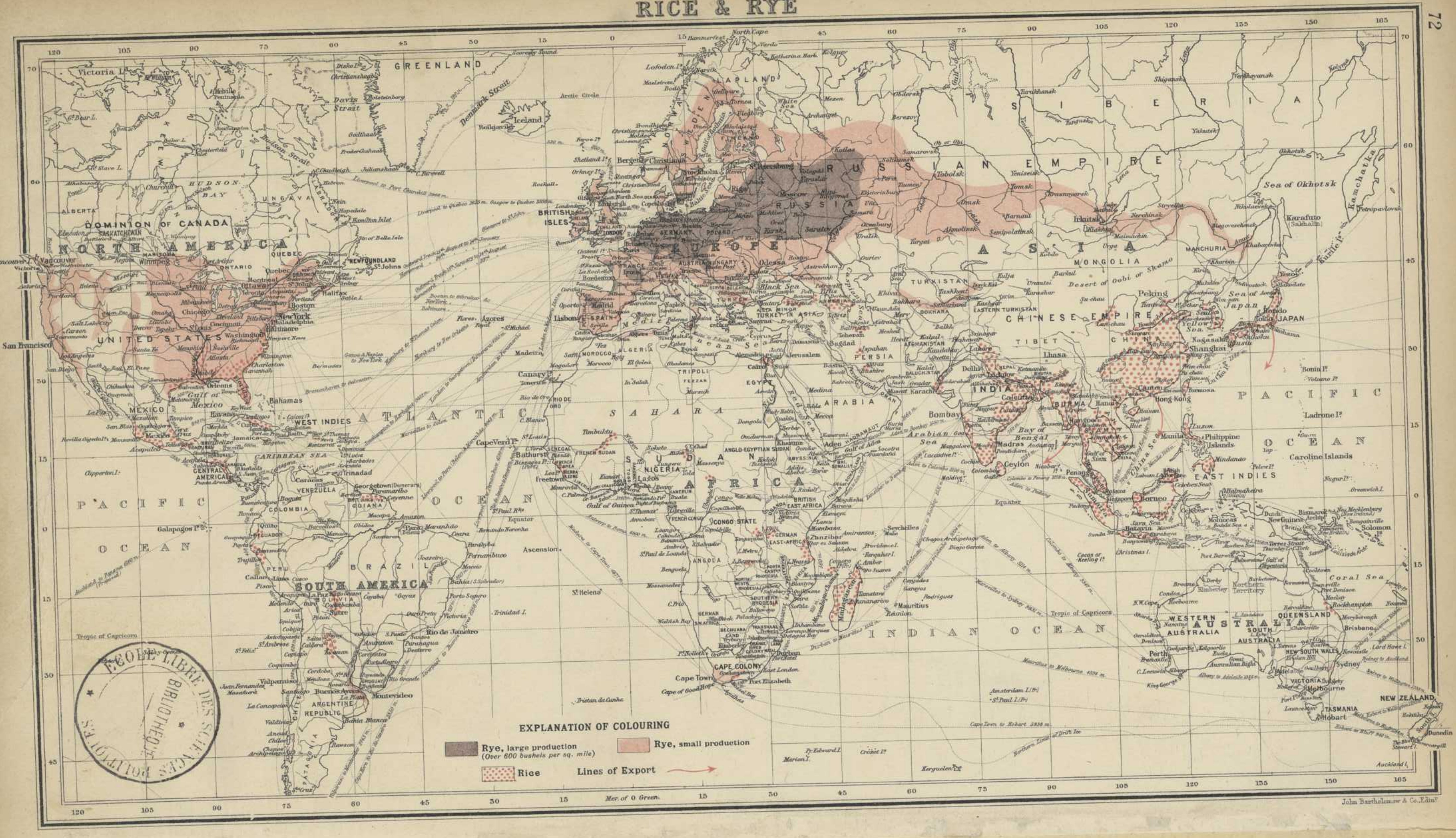





OATS
EXPLANATION OF COLOURING
Large Production (Over 600 bushels per sq. mile)
Small Production
Lines of Export

DOMINION OF CANADA
NORTH AMERICA
UNITED STATES
SOUTH AMERICA
EUROPE
RUSSIAN EMPIRE
ASIA
AFRICA
AUSTRALIA
ATLANTIC OCEAN
PACIFIC OCEAN
INDIAN OCEAN

# RICE & RYE



NORTH AMERICA
DOMINION OF CANADA
UNITED STATES
MEXICO
WEST INDIES
SOUTH AMERICA
BRAZIL
ARGENTINE REPUBLIC
GREENLAND
ATLANTIC OCEAN
PACIFIC OCEAN
EUROPE
RUSSIA
RUSSIAN EMPIRE
SIBERIA
ASIA
CHINESE EMPIRE
CHINA
JAPAN
INDIA
AFRICA
SAHARA
SUDAN
CONGO STATE
CAPE COLONY
INDIAN OCEAN
AUSTRALIA
NEW ZEALAND
EAST INDIES
EXPLANATION OF COLOURING
Rye, large production (Over 600 bushels per sq. mile)
Rye, small production
Rice
Lines of Export
Mer. of 0 Green.
John Bartholomew & Co. Edin.

# RICE.

**General Summary**—Next to wheat, rice is the most important cereal, forming the chief food of many millions of people in the east and south-east of Asia, and being consumed in smaller quantities in most parts of the globe. The only important species, *Oryza sativa* thrives in tropical and subtropical countries, more particularly in the latter, and is cultivated as far north as 38° in China and Japan. It is an annual, varying in height from 1 to 6 feet, and is found in numerous varieties. Rice requires to be flooded at certain seasons and to be well drained. Therefore it is usually cultivated in valley bottoms where the water can easily be poured over the ground and drained off again by irrigation channels. Some varieties are indeed cultivated on higher lands but yield a small crop and of inferior quality. In Texas the yield with care and good cultivation is at least 2700 lbs. per acre, while in Bengal it is only 1200; in Burma as much as 2500 is obtained on some lands. When the husk is removed from the rough rice, or paddy, the weight is thereby reduced by one-fifth to one-third. Rice, containing a smaller proportion of introgenous elements than any other grain, is less nutritious, and being deficient in gluten, cannot be properly fermented and made into bread. The Japanese and Chinese make intoxicating liquors from rice by adding ferments. In Europe it is largely employed for the extraction of starch. The refuse is excellent food for cattle, and the straw also is a valuable fodder, and in the East is made into plait for hats and shoes. In the United States, where the plant was introduced late in the 17th century, the production has increased enormously in the last few years.

**ANNUAL PRODUCTION OF RICE**—Total - 1,257,860,500 cwts.





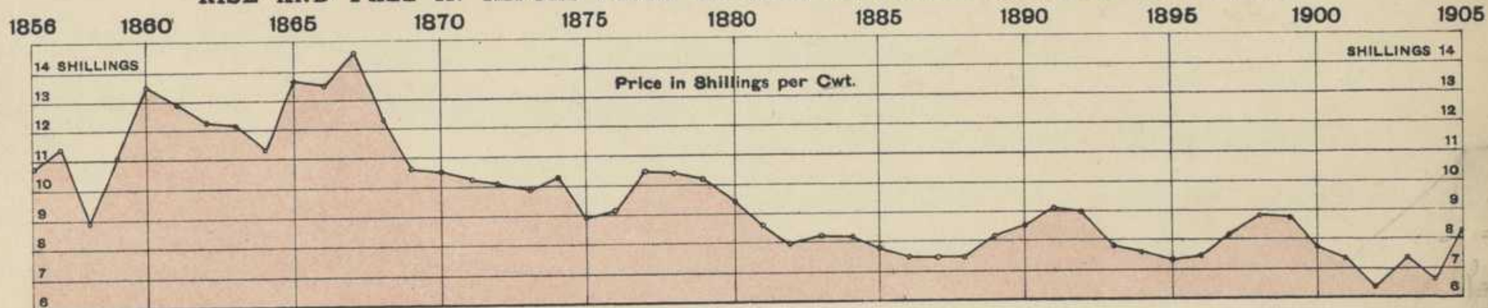
The quantity given for China is only a very rough estimate, exact figures not being available. Java, though a large producer, is obliged to import rice A remarkable extension of cultivation has taken place in the United States (Texas and Louisiana); the yield rose in 1904 to 18½ million bushels, but sank again to 12½ in 1905, still a large quantity compared to previous years.

**SOURCES OF BRITISH SUPPLY OF RICE OF ALL KINDS** (Average 1903-5)

Total, 5,287,720 cwts. £2,179,980 value

BURMA 2,876,123 cwts. or 54·4 %
INDIA 938,004 cwts. or 17·7 %
STRAITS SETTLEMENTS 168,751 CWTS. OR 3·2 %
HOLLAND 550,681 CWTS. OR 10·4 %
GERMANY 258,268 CWTS. OR 4·9 %
SIAM 167,850 CWTS. OR 3·2 %
FRENCH INDO-CHINA 141,388 CWTS. OR 2·7 %
OTHER FOR. COUNTRIES 187,105 CWTS. OR 3·5 %

**RISE AND FALL IN IMPORT PRICE OF RICE IN UNITED KINGDOM SINCE 1856**




# RYE.

**General Summary.**—A cereal (*Secale cereale*) allied to wheat and barley, which is grown in most European countries, the United States, Canada, Argentina, Australia, and most extensively in Holland and Belgium, in Germany and Central Russia, where it is much used as a bread-stuff. It is also used in the manufacture of spirits, particularly gin and Hollands, and of the Russian *kvass*, or beer. In many countries it is often sown as a green fodder for sheep and oxen. The straw is very tough and forms excellent plait. Rye does not range so far north as barley, but it will bear a more severe climate than wheat and will thrive on poor and sandy soils unfit for other grain. It is generally grown as a winter crop.

**ANNUAL PRODUCTION OF RYE** (Average of three latest years available)

Total—1,672,888,000 bushels




The production is increasing considerably in Austria, and there is a fair increase in Russia and Germany. In the United Kingdom the acreage is decreasing, especially in Ireland. There are no returns of the production.

The Hungarian Minister of Agriculture estimates the World's Production of Rye for 1906 at 1408,928,000 bushels, being 50,720,000 bushels less than in 1905.

**SOURCES OF BRITISH SUPPLY OF RYE** (Average 1903-5)

Total, 1,066,721 cwts. £296,099 value

RUSSIA 618,902 cwts. or 58·0 %
UNITED STATES 171,064 cwts. or 16·0 %
CANADA 110,332 cwts. or 10·4 %
GERMANY 97,274 cwts. or 9·1 %
RUMANIA 55,038 cwts. or 5·2 %
OTHERS, 14,111 C. OR 1·3 %

On the whole the imports have been trebled in the last twenty years, though the maximum was in 1888. In 1904 and 1905 the imports from the United States were much less than in previous years.

# BARLEY, MILLET & SAGO

## BARLEY
EXPLANATION OF COLOURING

Large Production (Over 500 bushels per sq. mile)

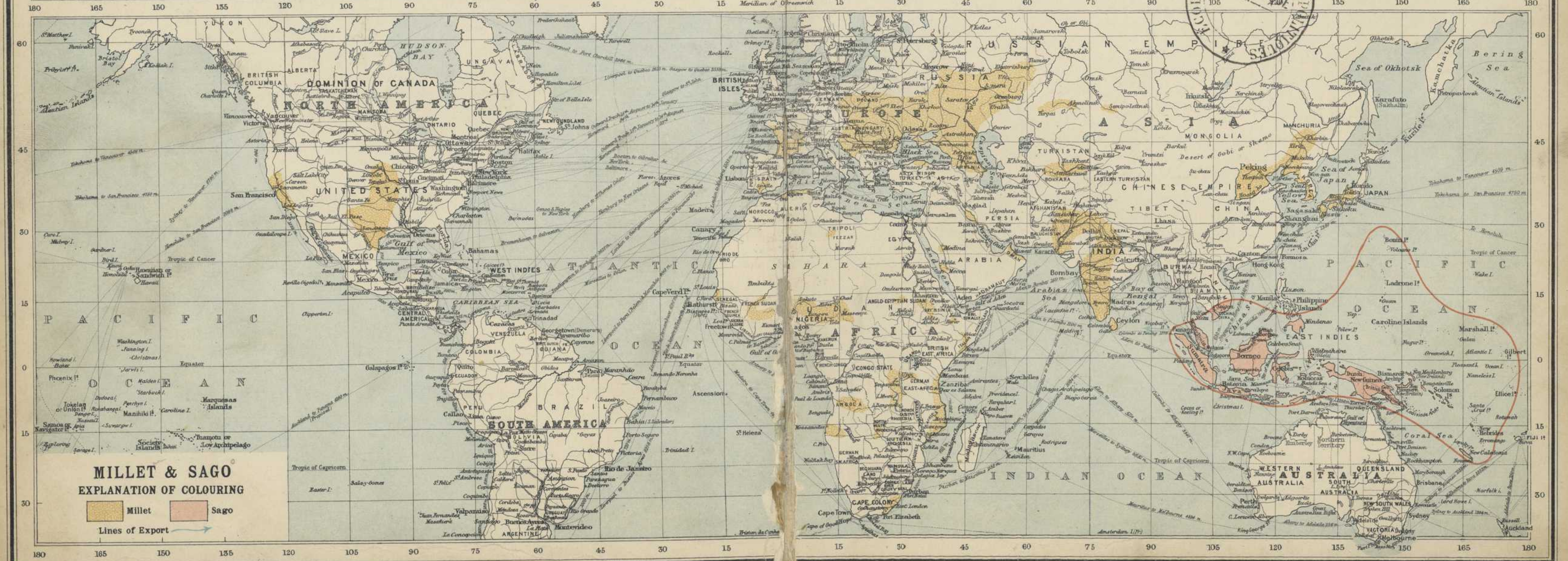
Small Production

Lines of Export

NORTH AMERICA
DOMINION OF CANADA
UNITED STATES
SOUTH AMERICA
EUROPE
RUSSIAN EMPIRE
ASIA
CHINESE EMPIRE
INDIA
AFRICA
AUSTRALIA
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN





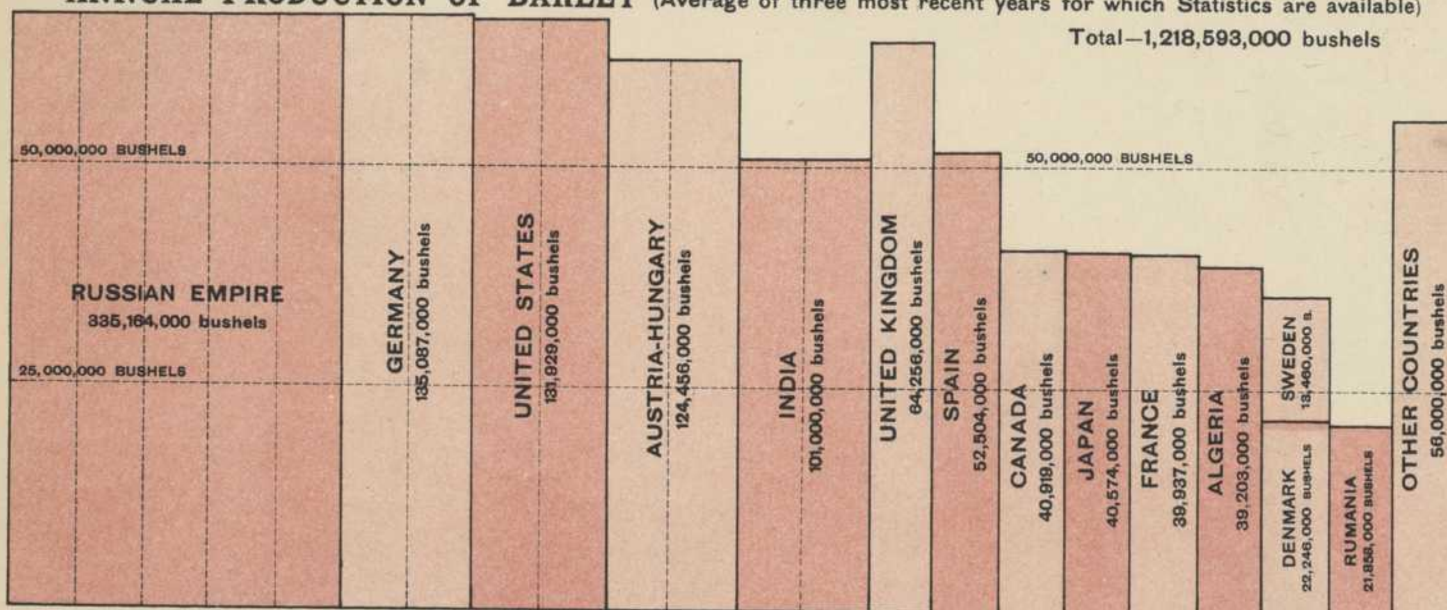



John Bartholomew & Co. Edin<sup></sup>

# BARLEY.

**General Summary.**—The most common species of this cereal are *Hordeum vulgare* with four rows of grains in the ear; *H. hexastichum* (bere or bigg) with six; and *H. distichum* with two rows. Barley has a wider range than other cereals, being better able to endure low temperatures and humidity, and ripening in a shorter period, it can be cultivated in Norway as far north as 70° and at Yakutsk in Siberia. It prefers, however, a warm and fairly dry climate. In the north it is associated with oats and in the south with wheat, and extends towards the equator at ordinary elevations as far as Madras and Chiapas in Mexico. In the most northern countries of Europe it is used for human food, in the central as food for horses and largely in brewing and distilling, while in the southern countries it is given to horses or exported. The chief exporting countries are Russia, Denmark, and Turkey, the countries of Africa bordering on the Mediterranean, Canada and the United States. When stripped of its husk and polished it is known as pearl barley.

## ANNUAL PRODUCTION OF BARLEY (Average of three most recent years for which Statistics are available)

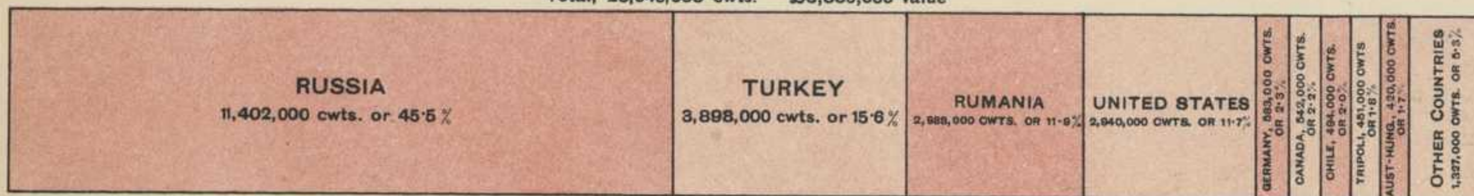



The production of barley in the United Kingdom, as of other grain, has fallen off, the acreage under barley being only two-thirds as large as it was 22 years ago. In France also the cultivation has decreased of late. In the United States the annual increase has been very large, especially in the present century.

The Hungarian Minister of Agriculture estimates the World's Production of Barley for 1906 at 1385,296,000 bushels, being 33,488,000 bushels less than in 1905.

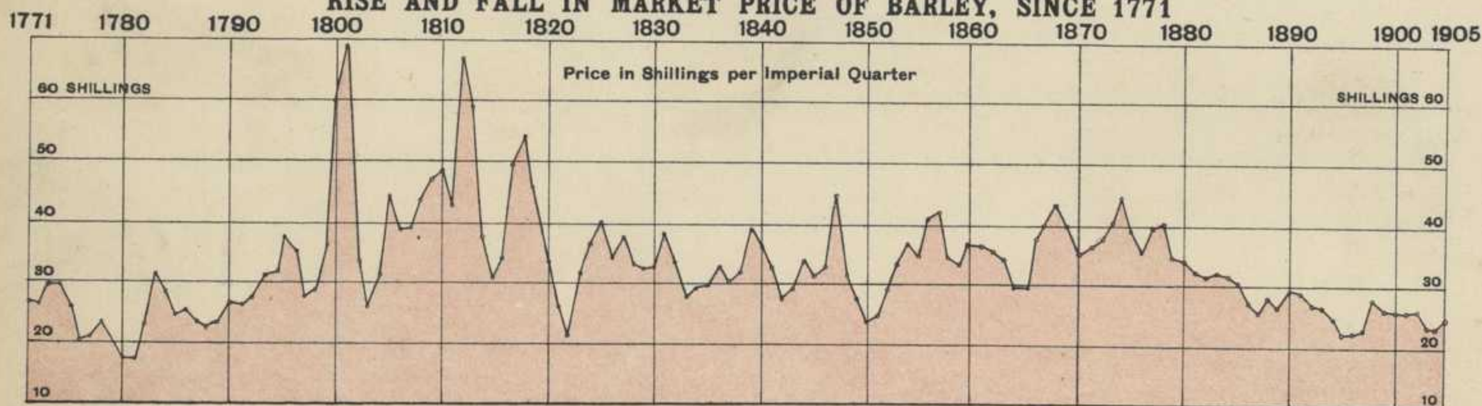
## SOURCES OF BRITISH SUPPLY OF BARLEY (Average 1902-5)

Total, 25,045,000 cwts. £6,800,000 value




The imports in 1905 were considerably less than in the three previous years, but in the last 20 years have risen about 60 per cent. The United States supplied much less in 1905 than usual.

## RISE AND FALL IN MARKET PRICE OF BARLEY, SINCE 1771



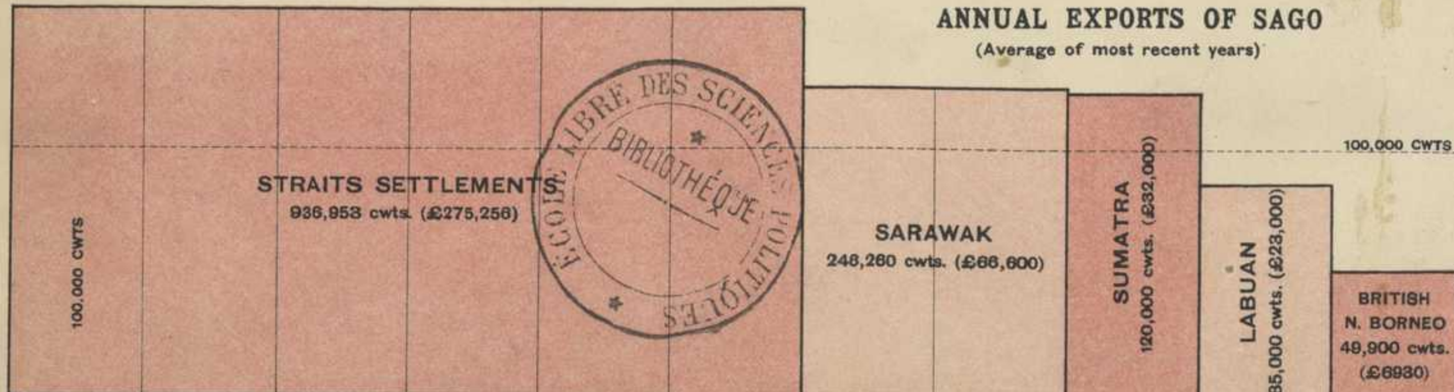

The high prices in 1801 and 1812, are, like those of wheat due to the war. In the last 25 years, imports from America have produced a steady fall.

**SAGO.**—The pith of several species of palm but chiefly of *Sagus (Metroxylon)* Rumphii and *S. lævis*. Each tree yields about 600 lbs. of pith. The sago palms are natives of the Malay Archipelago, New Guinea, and Mindanao, and are cultivated in the Malay Peninsula, Cochin-China, etc. Large quantities are exported, chiefly through Singapore, in the forms of common brown sago, sago flour and pearl sago. The last is prepared in Malaysia by the Chinese, and is in small white spherical grains. The pith of several other trees—*Caryota urens*, *Arenga saccharifera*, etc.—is similarly prepared and is called sago. West Indian sago is obtained from cycads. In Europe sago is used sparingly in cookery, is given to fowls, and is utilized by starch and cocoa manufacturers.

For Millet see the List of Commodities.

## ANNUAL EXPORTS OF SAGO

(Average of most recent years)

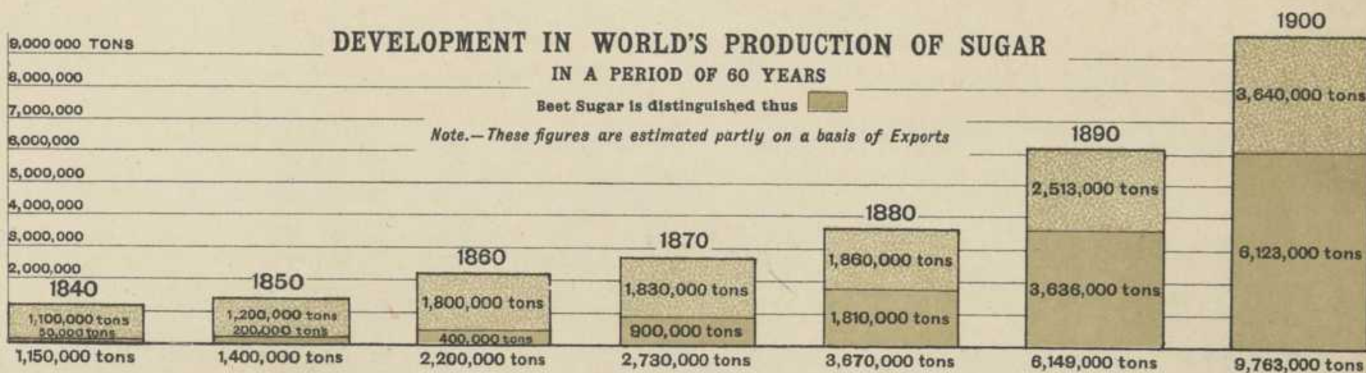




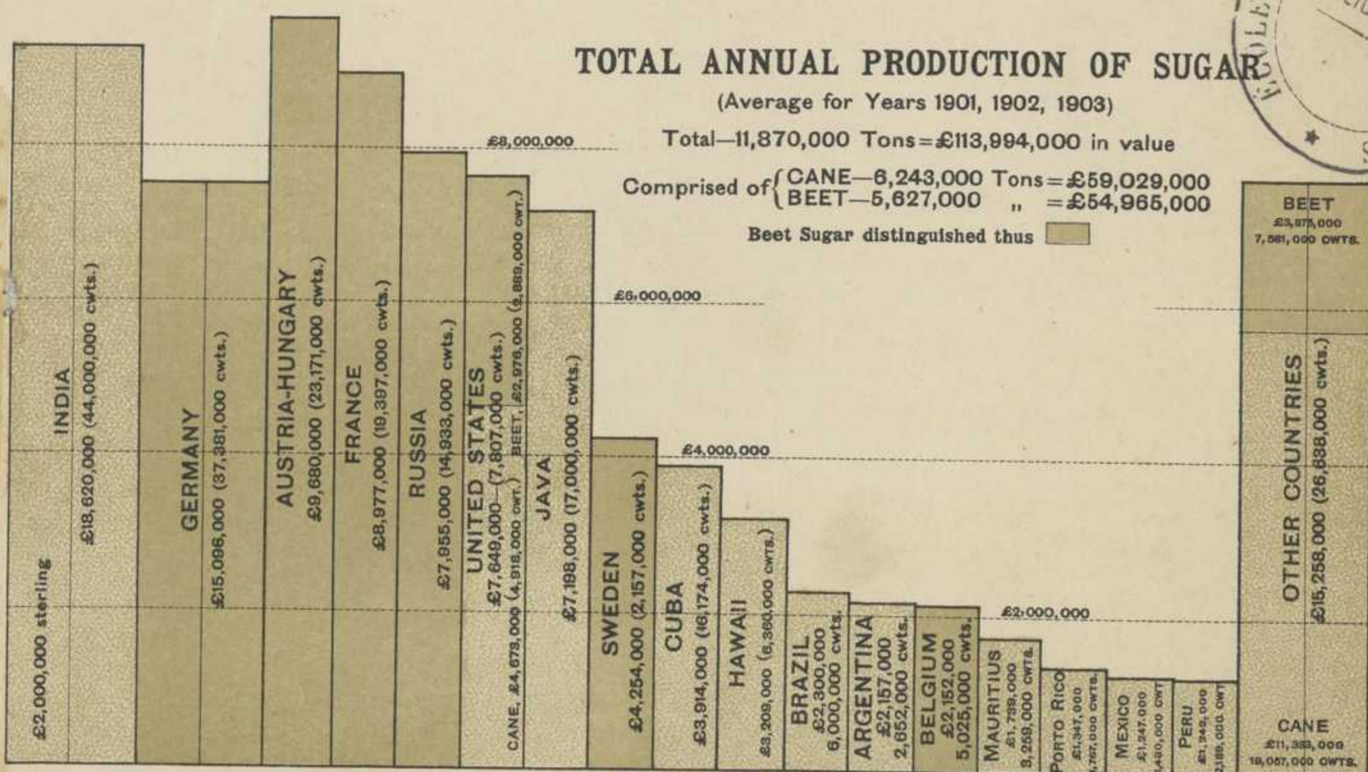
Small quantities not shown in the diagram are exported from India and other countries. Singapore is the chief market, and of the quantity shown above, less than half is produced in the Straits Settlements.

# SUGAR.

**General Summary.**—Sucrose, or cane-sugar, is found in many forms of vegetation, and has been extracted from very ancient times. Herodotus speaks of sugar made from the Phœnix palm, and many classical writers mention "honey of canes." The name is derived from the Sanscrit word *Sharkara*, meaning a substance in fine grains, and probably cane-sugar was first obtained in a dry granulated form in Bengal, where, as in many countries at the present day, it was used as a food. The Chinese learned the process of manufacture from India in the 8th century, B.C.; in the 9th century, A.D., the sugar-cane was grown in Persia, and in the following century it was brought by the Arabs to the Mediterranean. Columbus is said to have carried the plant to San Domingo, which was for a long period the chief source of the European supply, and thence it spread over the neighbouring islands and continent. The *Saccharum officinale*, of which there are several varieties—the Creole of America, the Tahiti, Batavian, Chinese, etc.—is a large grass or reed 8 to 13 feet high, with stems 2 to 4 inches thick. It is now grown in all parts of the world within about 34° of the Equator, and is occasionally found at even a higher latitude, as in Spain. It is propagated by cuttings which yield a crop after 12 to 18 months. The roots continue to send up fresh canes for 20 years or more, but the crop becomes less and less, and therefore the fields are usually replanted every 4 or 5 years, and in parts of Java every year. The yield is about 10 or 12 tons of cane to the acre and in some countries much more—34 tons in Hawaii. The juice contains about 18 per cent. of raw sugar, and 20 to 25 cwts. of sugar are obtained from an acre of canes. Another important source from which sugar is obtained is beet-root (*Beta vulgaris*), of which there are different varieties. It was shown to contain a large proportion of sugar about the middle of the 18th century, but was not systematically cultivated for the purpose until the closure of the continental ports, when the manufacture of beet sugar was started in Germany in 1801, and Napoleon encouraged the enterprise in France in 1811. After his fall, cane sugar was again imported freely into the continent, and for some years the beet industry fell off, but it gradually revived and now beet sugar is produced in most of the countries of Europe and in the United States, and experiments have been made in other countries. At first the product was small, but by means of improved methods nearly 11 per cent. of sugar can now be extracted from the root, and the total production in the world nearly equals that of cane-sugar. The sugar is extracted from the cane or beet-root by rolling and pressing, whereby the cells are broken, and macerating the pulp, or by diffusion, that is by washing the sugar out of the unbroken cells, which retain the colloid, albuminous and other substances. The latter is the more profitable method. Formerly the muscovado or raw cane-sugar was frequently used in the condition in which it arrived from the country of its growth, but raw beet sugar has an unpleasant vegetable flavour, and now all sugars are refined by heating them with animal charcoal. Other sugars are chiefly of local importance. About 95 per cent. of the sugar consumed in India is obtained from palms—the Palmyra palm (*Borassus flabelliformis*), the bastard date palm (*Phœnix sylvestris*), and others—and small quantities of this *jaggery* are sent to Europe. In Canada and the northern States, the maple, *Acer saccharinum*, yields sugar, which is to a certain extent exported, and in the western States the sugar millet (*Sorghum saccharatum*) is cultivated for domestic use. Maize sugar has been manufactured especially in Mexico. The Brussels Sugar Convention of 1903, by which the chief European countries agreed to prohibit the introduction of sugar from countries where a bounty is given, or to levy countervailing duties, gave immediately a strong stimulus to the sugar industry in the West Indies which was in a languishing state owing to low prices.






The production of cane sugar is here shown to be greater than that of beet. The contrary is often stated and appears in the diagram, Development in World's Production. In such calculations, however, the home consumption in several producing countries is neglected and only the exports are included, notably in the case of India, which exports a very small fraction of its production. In European countries and their colonies the greater part of the sugar consumed is beet.

# SUGAR-GROWING COUNTRIES.

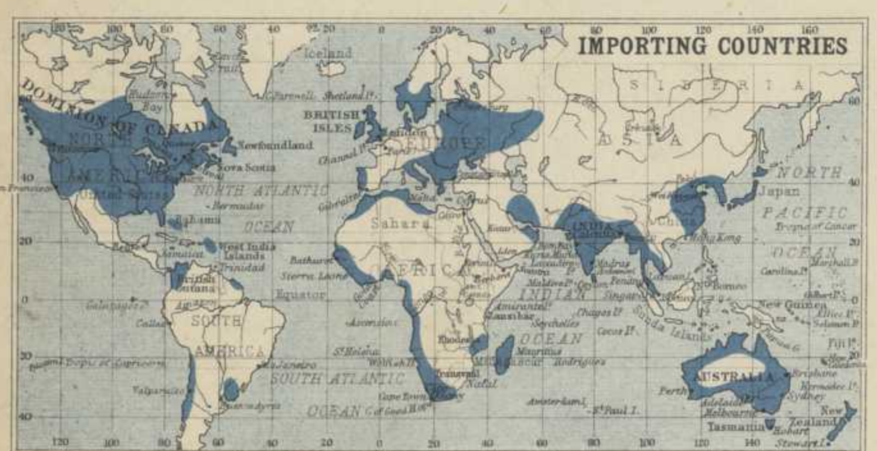


EXPLANATION OF COLOURING

Cane Sugar

Beet Sugar

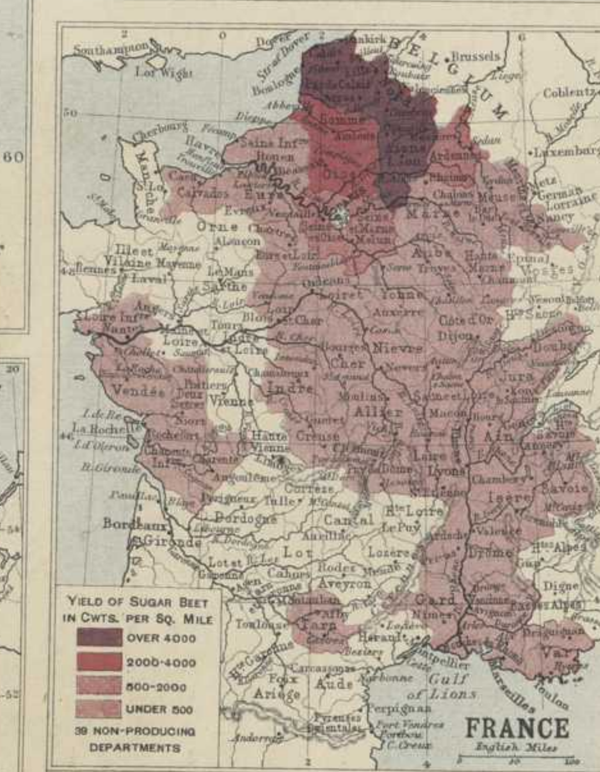
Lines of Export





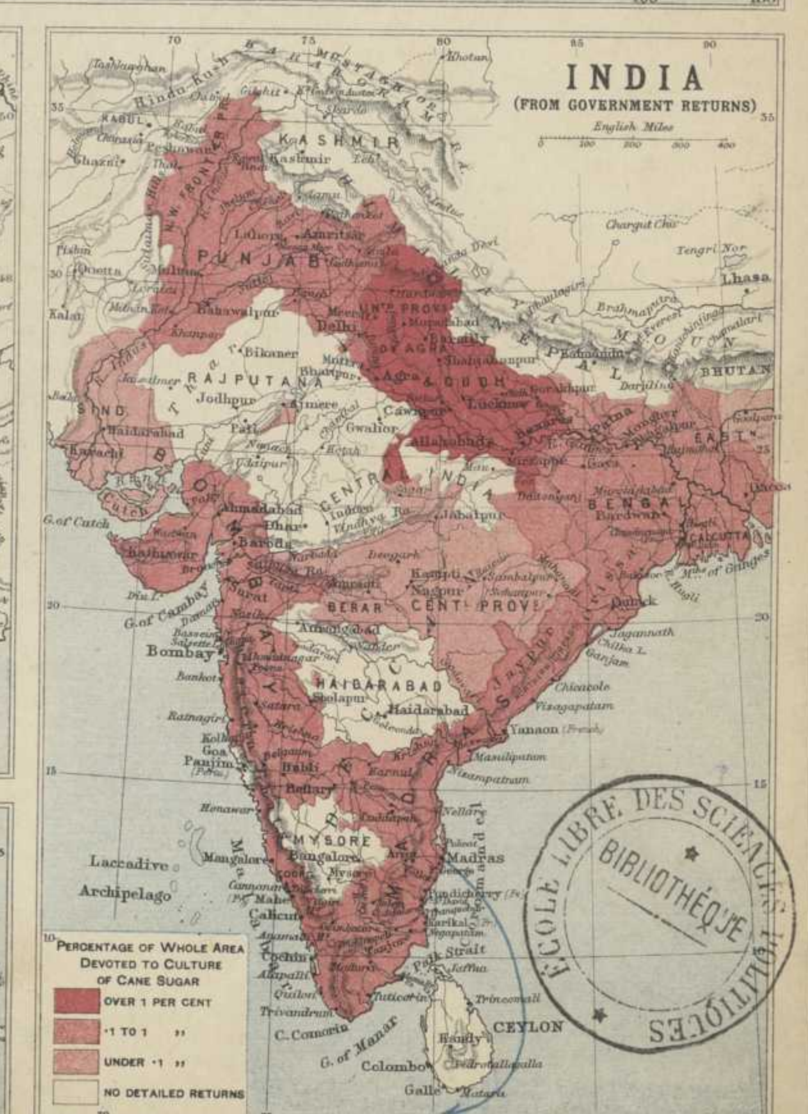












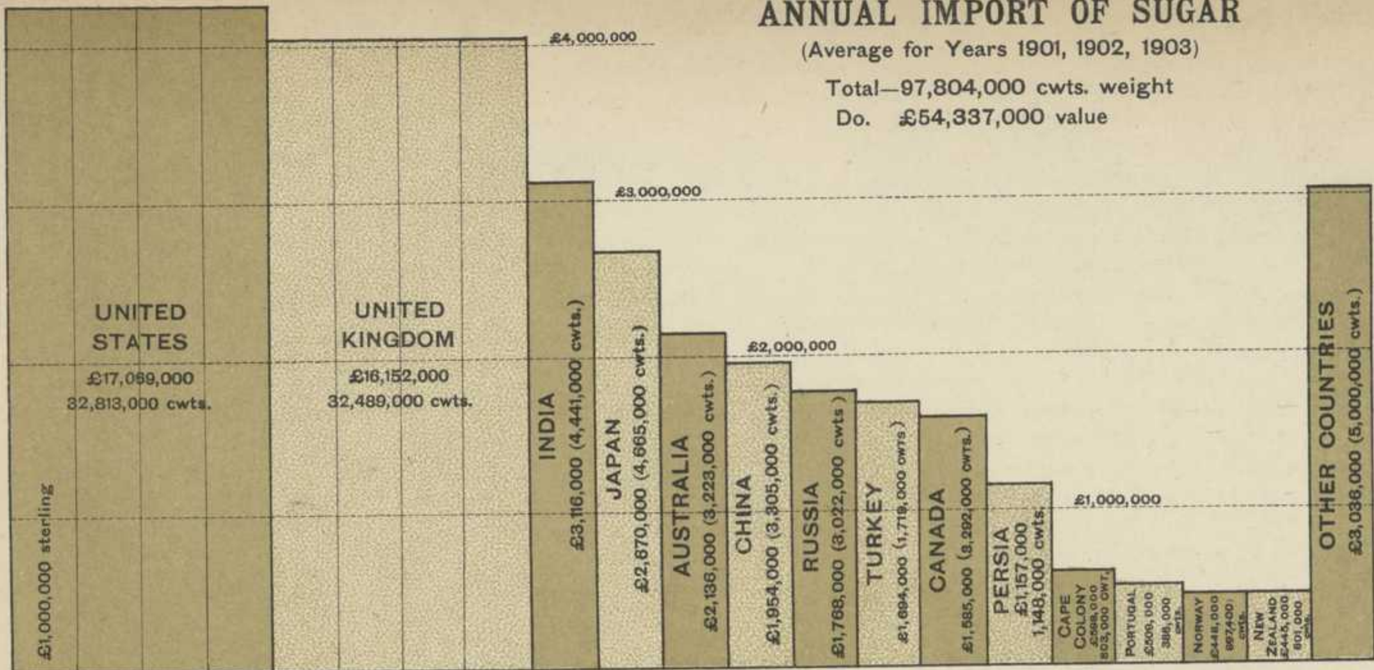



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## ANNUAL IMPORT OF SUGAR

(Average for Years 1901, 1902, 1903)

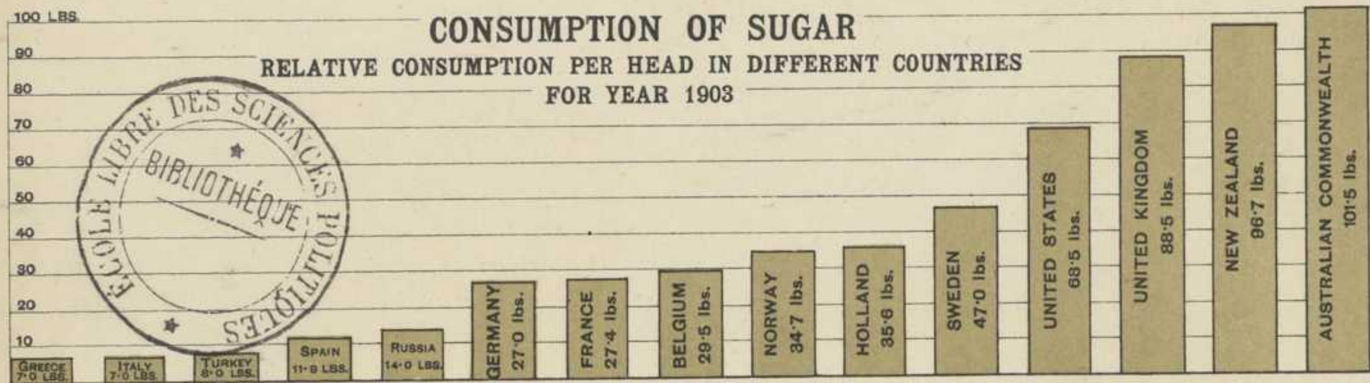
Total—97,804,000 cwts. weight
Do. £54,337,000 value




In the case of those countries where there is no home production the above are the quantities consumed, approximately that is, for some sugar may be exported as sweetening for chocolate, preserved fruits, and other goods. Such articles are also imported into many of the countries besides the sugar shown in the diagram.

## CONSUMPTION OF SUGAR

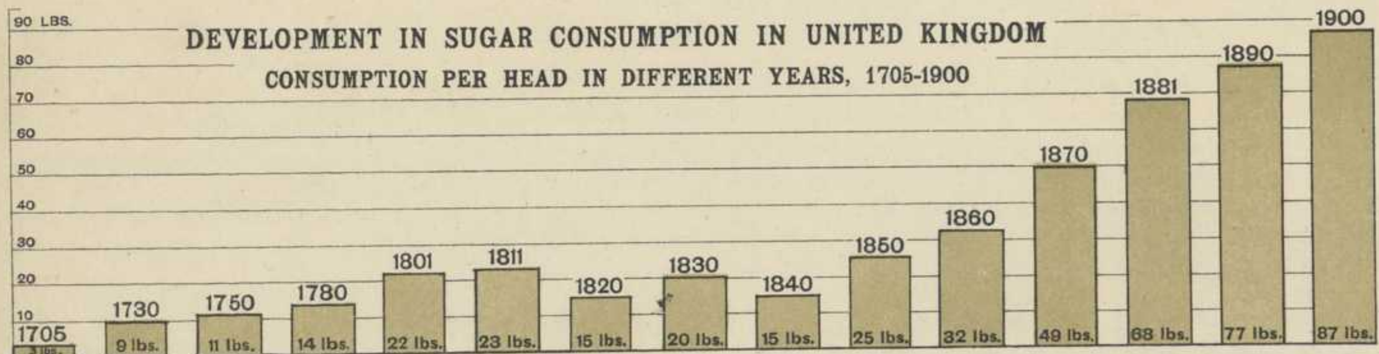
RELATIVE CONSUMPTION PER HEAD IN DIFFERENT COUNTRIES FOR YEAR 1903





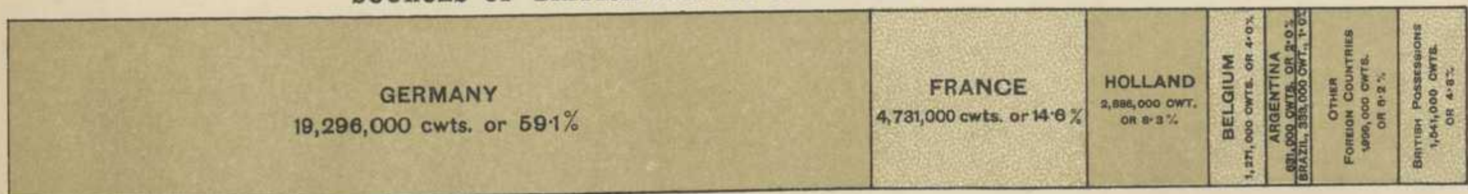

## DEVELOPMENT IN SUGAR CONSUMPTION IN UNITED KINGDOM

CONSUMPTION PER HEAD IN DIFFERENT YEARS, 1705-1900

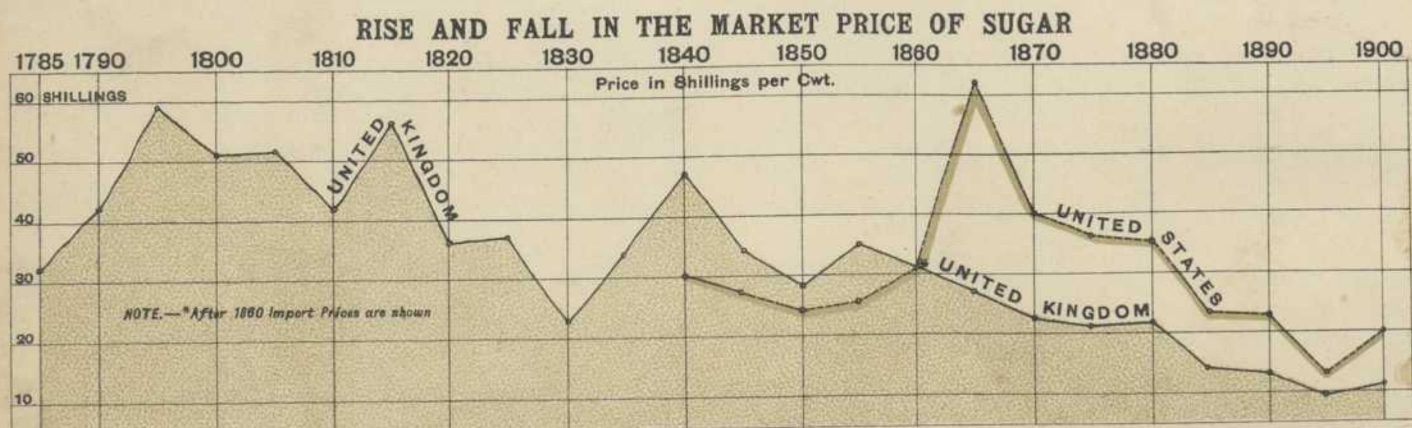



This diagram shows the effect of the introduction of beet sugar, the rise in the consumption being very rapid from 1840, when beet sugar amounted to little more than 4 per cent. of the world's production.

## SOURCES OF BRITISH SUPPLY OF SUGAR (Averages, 1901-1903)



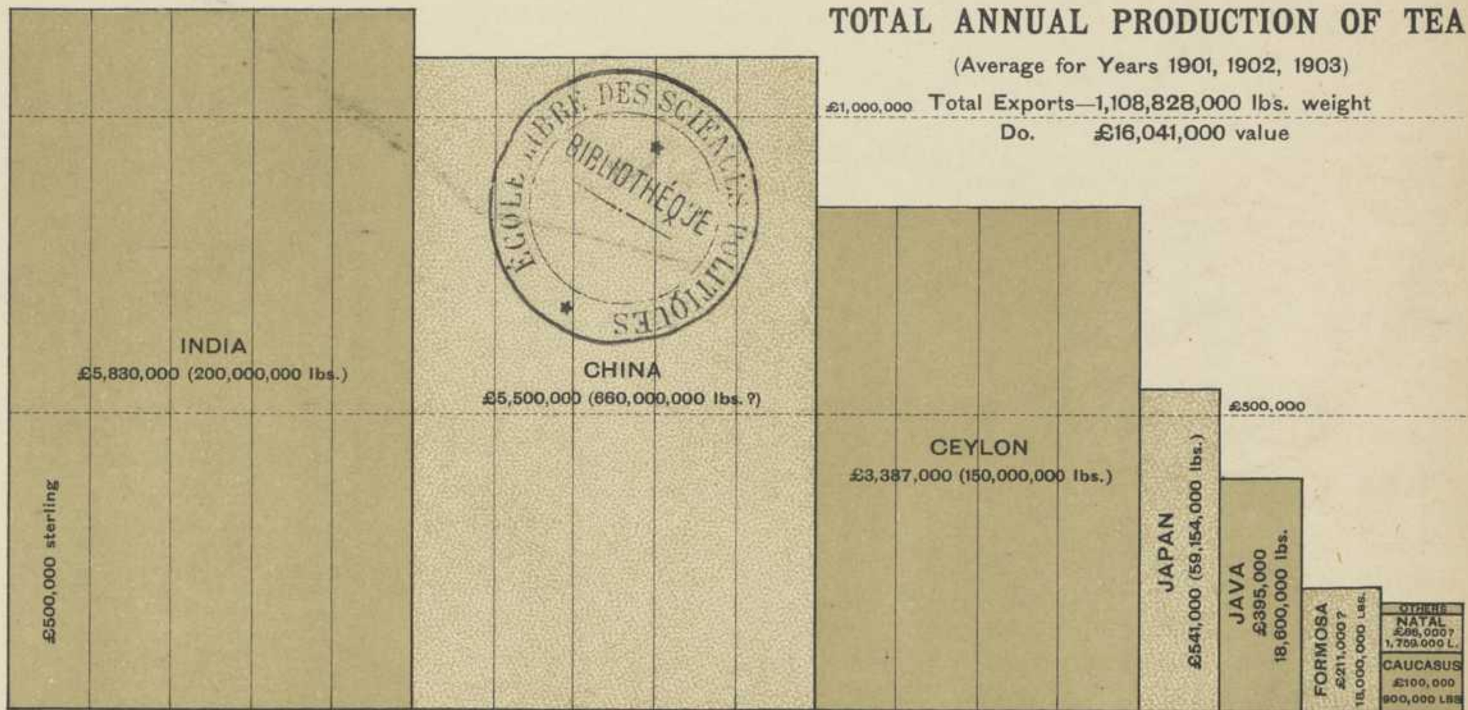

## RISE AND FALL IN THE MARKET PRICE OF SUGAR




It is difficult to obtain series of prices for the United States and the United Kingdom which are exactly comparable. In the above the prices are those of raw sugar on the New York market. The import values in the United States returns are those of the country of origin, not at the port of entry. The production diagram shows that sugar is dear in the United States.

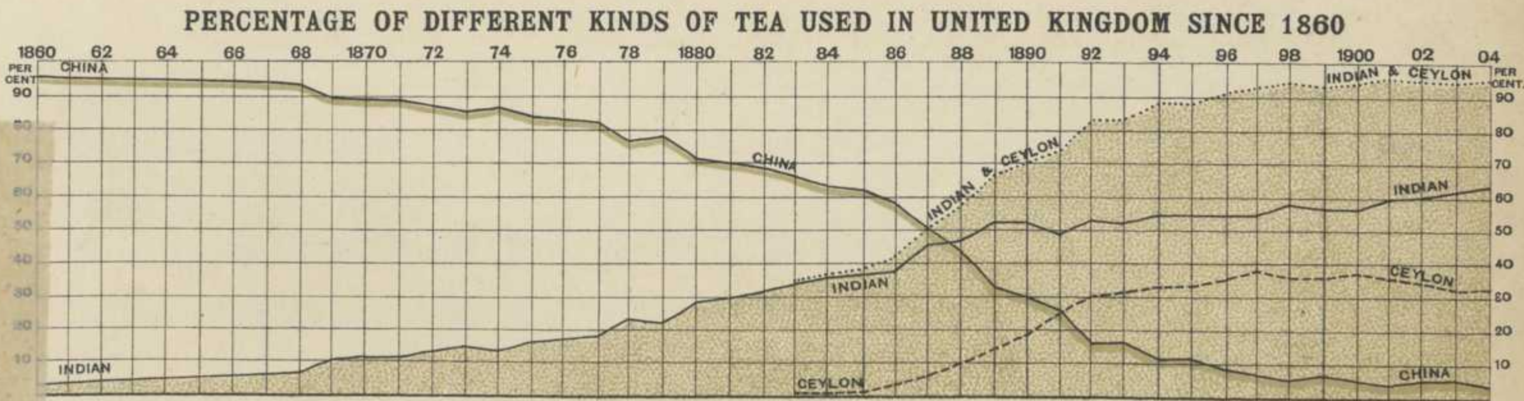
# TEA

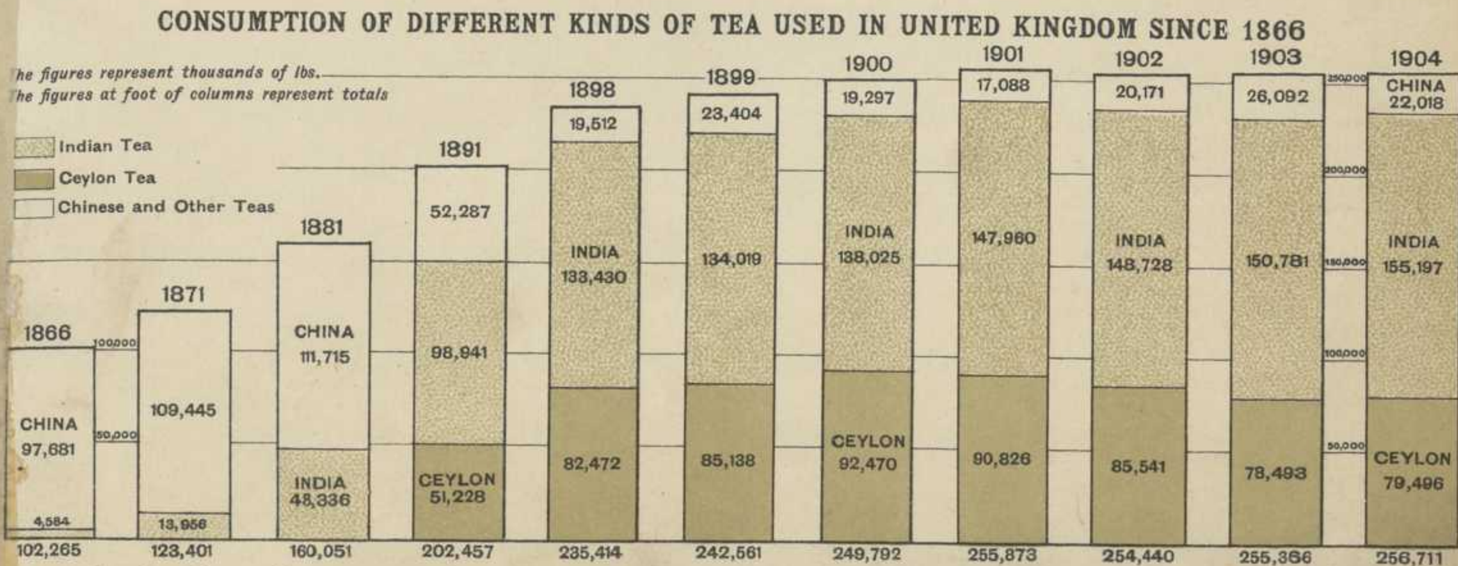
**General Summary.**—The tea-plant, *Camellia theifera*, grows in tropical and sub-tropical climates, where the rainfall exceeds 60 inches and is fairly equally distributed throughout the year. It will grow on any soil, but prefers a rich loam with a fair admixture of sand to promote drainage. In Japan it is cultivated up to lat. 40° N., and within the last 20 years has been introduced to the Black Sea slope of Transcaucasia. The original home is supposed by some authorities to have been Upper Burma and the Shan States, and the varieties *Assamica* and *Sinensis* to have been developed by difference of climate. The former will, if allowed, shoot up to a height of 50 feet, and bears larger leaves than the Chinese variety, which, on the other hand, will thrive in a severer climate. At Darjiling (India) and in Ceylon the plant grows up to heights of 6000 to 7000 feet, and at high elevations bears leaves of excellent flavour Hybrids of the Assam and Chinese varieties are specially adapted for cold regions and bear the cold winters of Batum. An acre of tea-plants yields 300 to 500 lbs. of tea, and on the Mariawatte estate in Ceylon the crop in 1900 amounted to 996 lbs. per acre. The best quality of black tea is Flowery Pekoe, made from the buds; then follow in order Orange Pekoe, Pekoe, Pekoe Souchong, Souchong, Congou and Bohea. Green tea, which is fired before fermentation sets in, is exported chiefly to the United States and Canada. The varieties are Gunpowder, Hyson, Young Hyson, and Twankay. Until the middle of last century China was the source of almost all the tea consumed in Europe, Japan also contributing a small quantity. In the thirties, however, the discovery of the tea-plant in Assam led to the cultivation of tea in India, and in 1841 the first sale of Indian tea was held in London, since when the exports have steadily and rapidly increased. In Ceylon the ravages of leaf disease among the coffee plants, which became very disastrous in 1881-2, gave a great impetus to tea planting which had for some years been prosecuted on a small scale. Meanwhile the exports of Chinese tea, carelessly prepared and often adulterated, have fallen off. Really good Chinese tea is still preferred by many connoisseurs, and the inferior qualities can be delivered at the ports at a smaller cost than Indian teas. Brick tea is also despatched from China to Central Asia, Manchuria, Siberia, and Russia, though the last country is now a large consumer of Indian tea.





The production of China has certainly fallen off, but the present quantity can only be very roughly estimated. Much is consumed in the country, being sold at the price of 2d. per lb., as calculated above; transport and *likin* duties bring up the shipping price to 5d. and 6d. The Indian production has increased 100-fold during the last 40 years, and as late as 1879 the exports from Ceylon was less than 100,000 lbs.




In the above diagram, teas from other countries than India and Ceylon are grouped with China tea. The China tea proper imported in 1904 was only about half the quantity, that is, about 11 million lbs. Besides the above, some 550,00 lbs. of broken leaves and twigs are imported for the manufacture of caffeine.

# TEA-GROWING COUNTRIES.



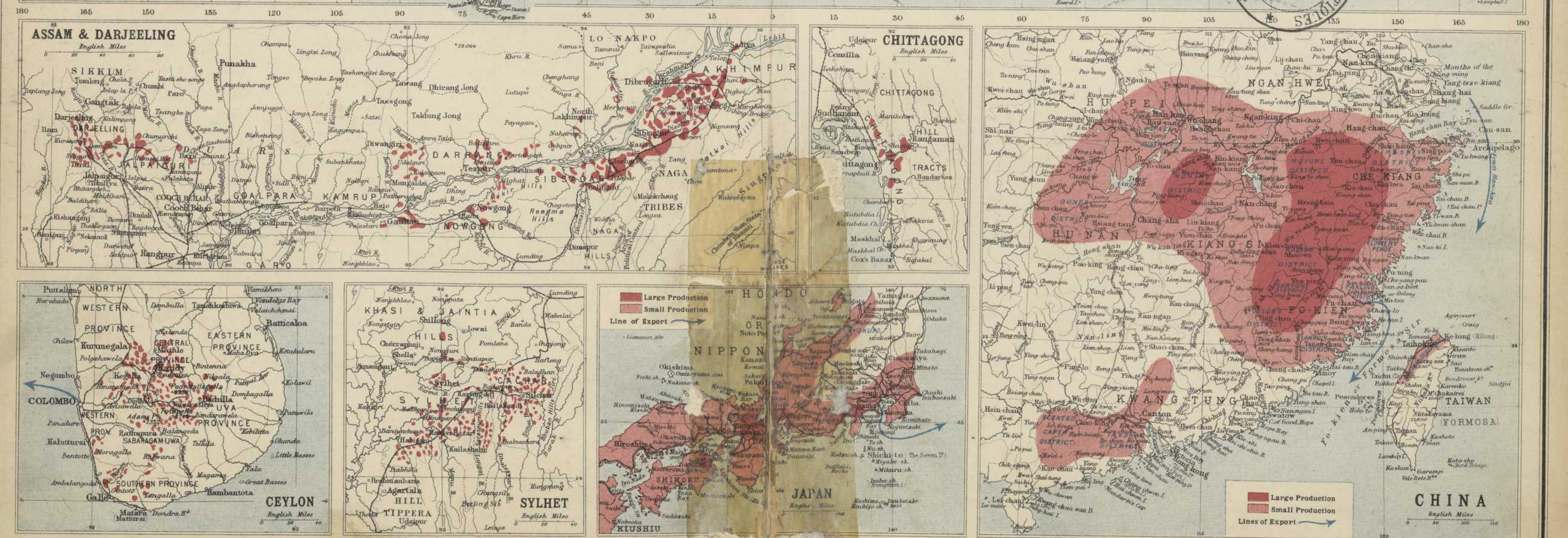
**EXPLANATION OF COLOURING**

| PRODUCING COUNTRIES | IMPORTING COUNTRIES |
| --- | --- |
| Large Production | Large Consumption (Over 4 lbs. per head per annum) |
| Small Production | Small Consumption |

Lines of Export

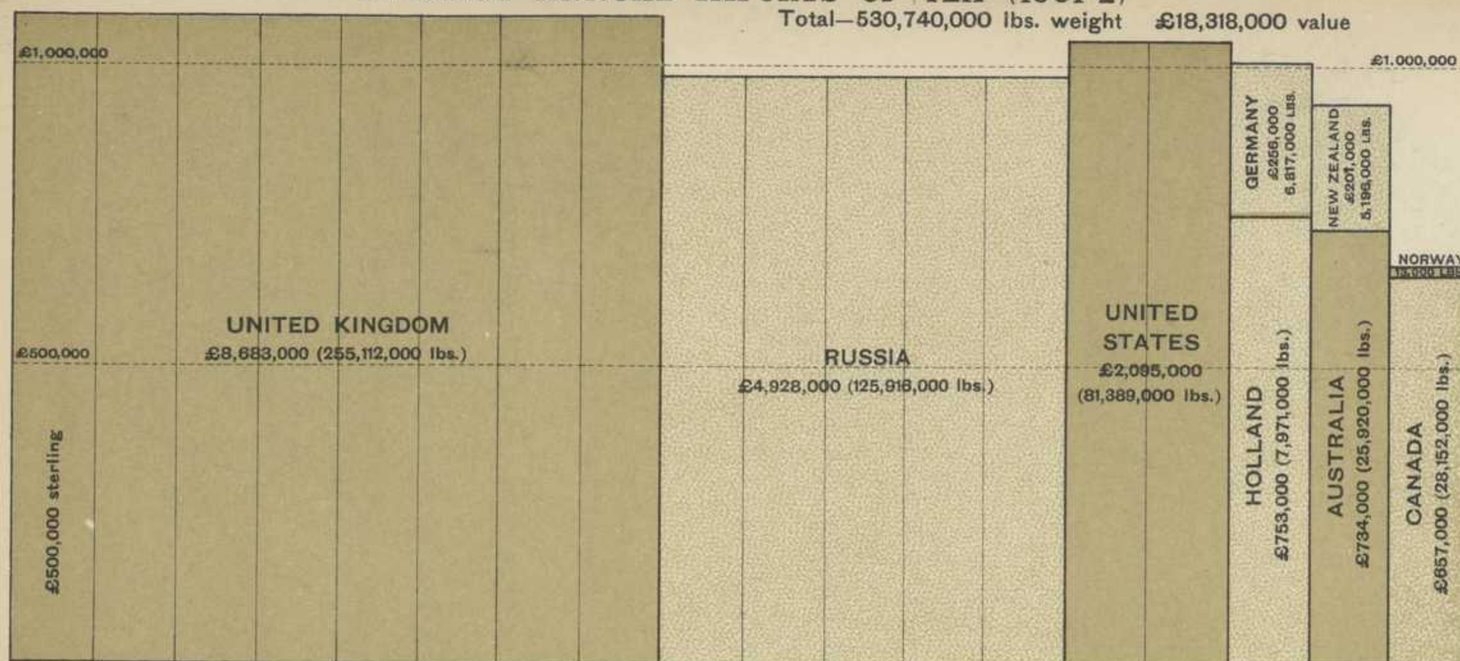


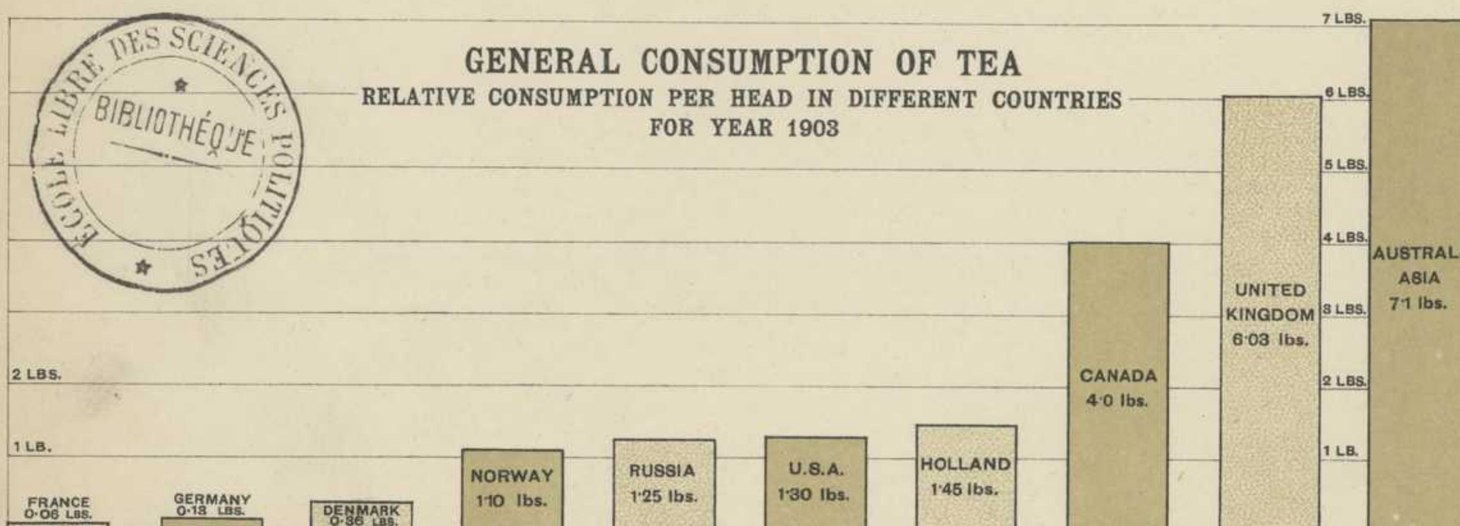




## AVERAGE ANNUAL IMPORTS OF TEA (1901-2)

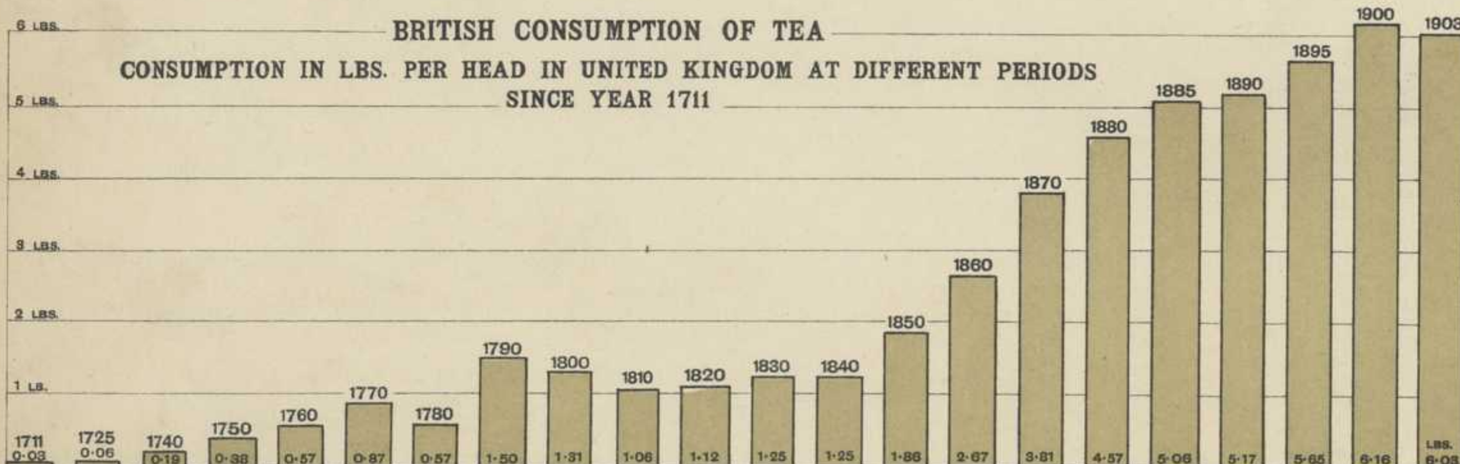
Total—530,740,000 lbs. weight £18,318,000 value



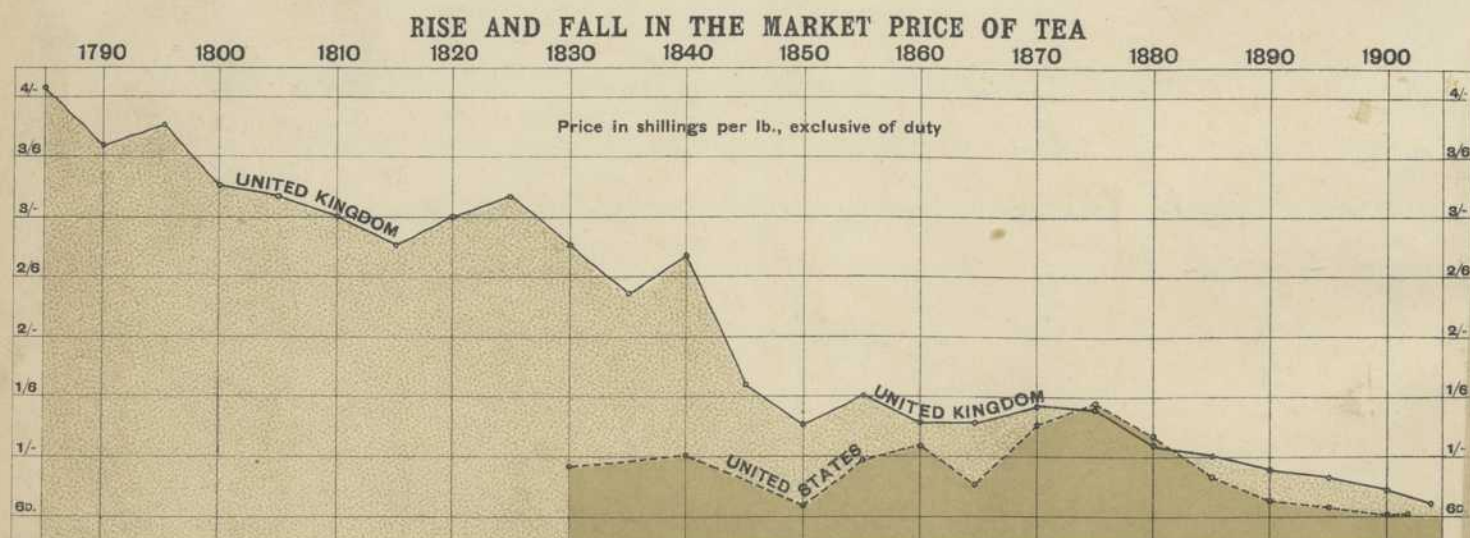


The large consumption in the British Empire is particularly striking. Russia is generally considered a tea-drinking nation, but the high price no doubt prevents its daily use except among the wealthier classes.




It is seen that a continuous rise in the consumption commenced after 1840, following the extension of tea-planting in India.

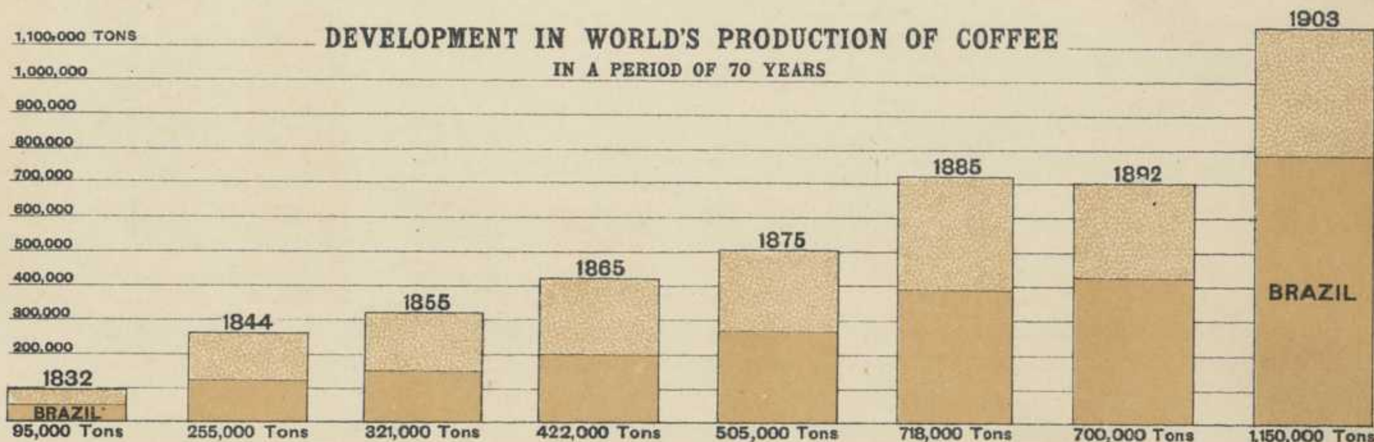
## RISE AND FALL IN THE MARKET PRICE OF TEA



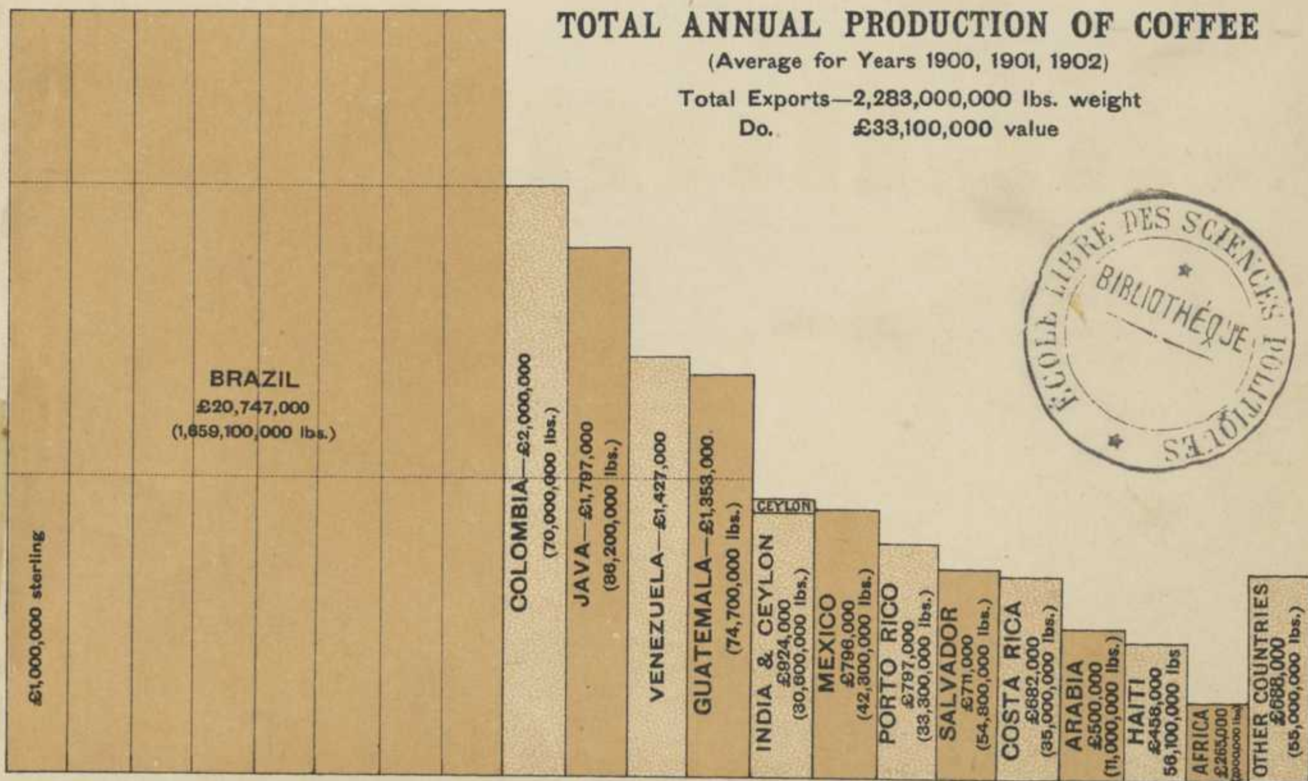

In spite of the increasing consumption, tea has, with slight variations, continued to fall in price owing to the enormous increase in production. The prices given above are the import prices before duty is paid, which in the United Kingdom is generally 4d. or 6d. per lb.—8d. in 1904. Since 1899 a duty has been imposed in the United States of about 6d. per lb.

# COFFEE

**General Summary.**—The coffee plant is a small shrub of the family Rubiaceæ, which has numerous representatives in the tropics, including many useful plants, such as cinchona, ipecacuanha, madder and gambier. Coffee is a native of Kaffa, in Abyssinia, but the name is more probably derived from the Arabic *gahveh*, meaning wine. It was introduced into Arabia at the beginning of the 15th century, and the beverage was first used in Constantinople in 1534. Rather more than a century later it spread over Europe, the first coffee house in London being opened in 1652. In 1650 the Dutch sent plants to Java, and in 1723 the cultivation of coffee was commenced in Martinique, whence it spread over the other Antilles and Central and South America. Of the genus Coffea there are more than thirty species, but only three are the objects of cultivation, *C. Arabica*, *C. Liberica*, and *C. Stenophylla*. The last has only recently been brought into cultivation, and *C. Liberica* is of inferior quality to *C. Arabica*, but bears greater heat, and is less subject to disease. Arabia and Abyssinia still supply good coffee, but in comparatively small quantities. Ceylon was formerly a large producer, three-fourths of the coffee imported into the United Kingdom coming from that island, until the trees were destroyed in the early eighties of last century by the *Hemeleia vastatrix*, a fungus which attacks the leaves, and is commonly known as "leaf disease." Tea was then introduced, but now coffee planting is to a certain extent reviving. At the present day South America is the greatest coffee-growing quarter of the globe, especially Brazil, which could alone provide for the consumption of the world. In this country the plant is cultivated chiefly in the German Colonies of Sao Paulo and Rio de Janeiro. Coffee thrives in all tropical countries, where the mean temperature is between 64° and 70° F., and in Peru and Ecuador is grown to a height of 6000 feet; indeed, near the Equator it cannot bear the heat at sea-level. The shrub begins to bear in its third year, and continues to yield good crops until its twentieth year. The fruit is oval and about the size of a cherry, and contains two seeds, which are the so-called coffee beans or berries. As the flowering season extends over eight months, the berries are not all ripe at the same time, and they are usually gathered about three times a year. After being dried in the sun, they are passed between rollers to remove the dried pulp. Each fruit contains two seeds enveloped in two coats, which are sometimes left on when the coffee is exported. Coffee which is not pulped is of inferior quality. From South America the beans are exported in bags of 60 kilograms (about 132 lbs.), and this is the weight of the bag generally used in statistics. In commerce coffee is distinguished as Mocha coffee, with small gray beans; Java, or East Indian, with large yellow beans; Jamaica, the beans of which are rather smaller and greenish; Surinam, which has the largest of all beans; and Bourbon, with very pale yellow beans. Coffee owes its exhilarating properties to the presence of caffeine, a volatile oil, and caffeo-tannic and caffeic acids.




The above diagram shows the enormous increase in the production of coffee during the past 70 years, and the increasing proportion yielded by Brazil, which enjoys exceptional advantages in climate, soil, and easy means of transport. In the year 1901–2 the production of this country was much larger than in 1903, amounting to nearly 945,000 tons, or about 82 per cent. of the production of the world, and more than the world's consumption, estimated at 915,000 tons.






The preponderance of Brazil appears in this diagram also. Colombia takes the second place, but no very recent statistics are available, and at the present price of coffee the value of its exports would be less than that of the Venezuelan sales. The production of Ceylon is insignificant, though thirty years ago, before the outbreak of leaf disease, it amounted to about one-sixth of the world's production. Besides the exports shown above, a considerable quantity of coffee is consumed in the producing countries.

# COFFEE – PRODUCTION & CONSUMPTION.

EXPLANATION OF COLOURING

| PRODUCING COUNTRIES | IMPORTING COUNTRIES |
| --- | --- |
| Large Production | Large Consumption (Over 6 lbs. per head per annum) |
| Small Production | Small Consumption |

Lines of Export







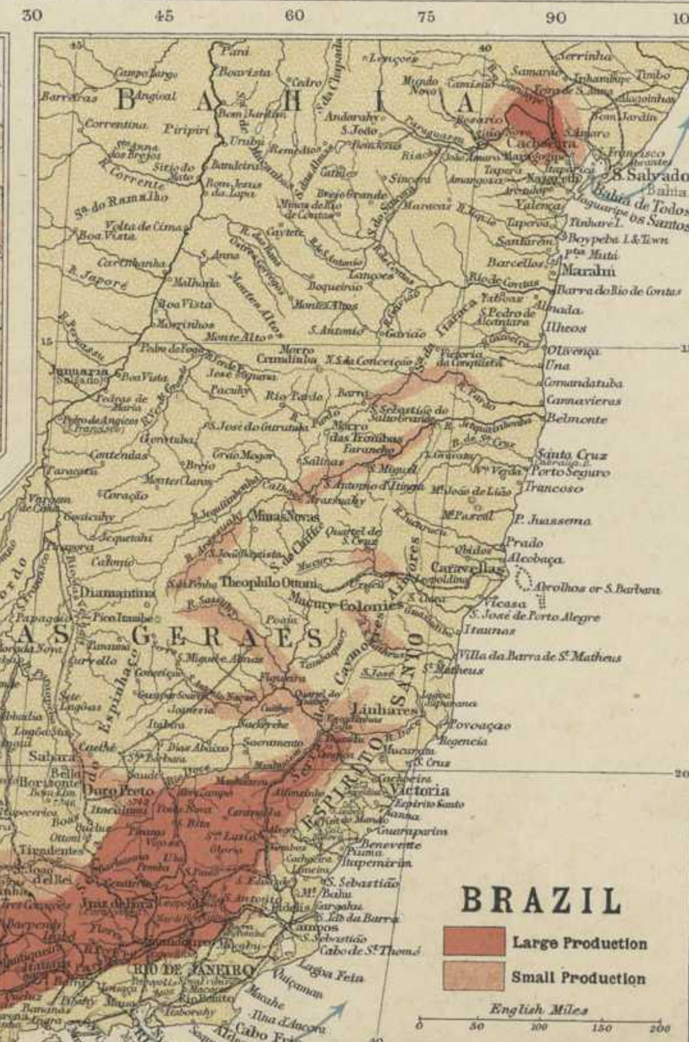


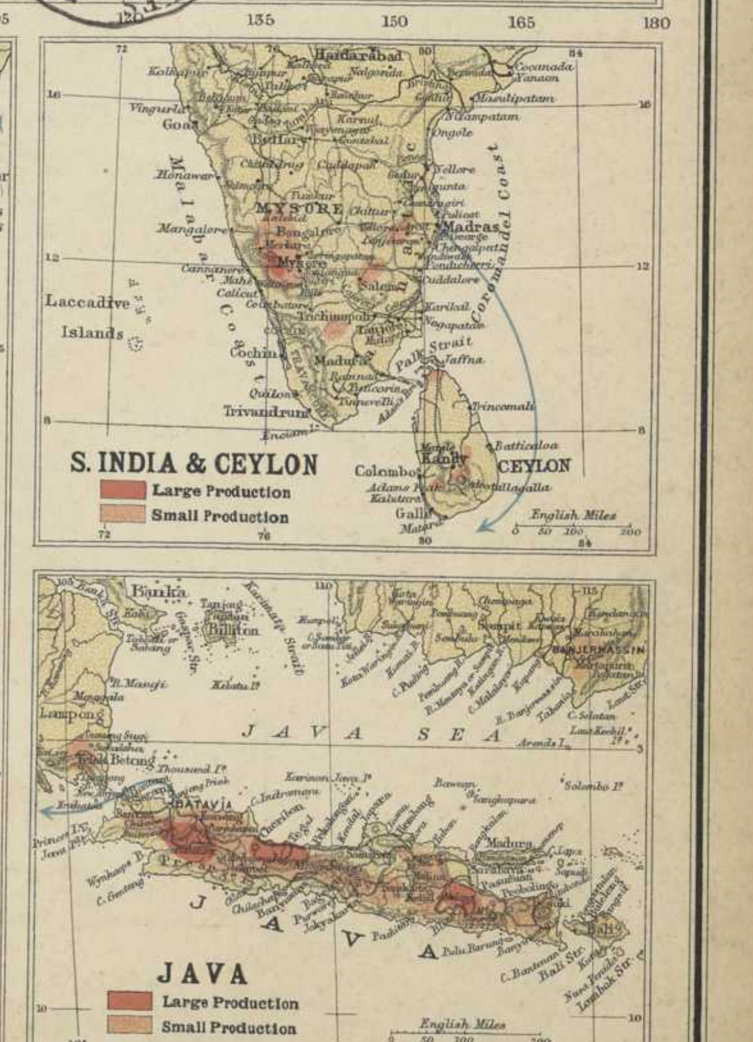




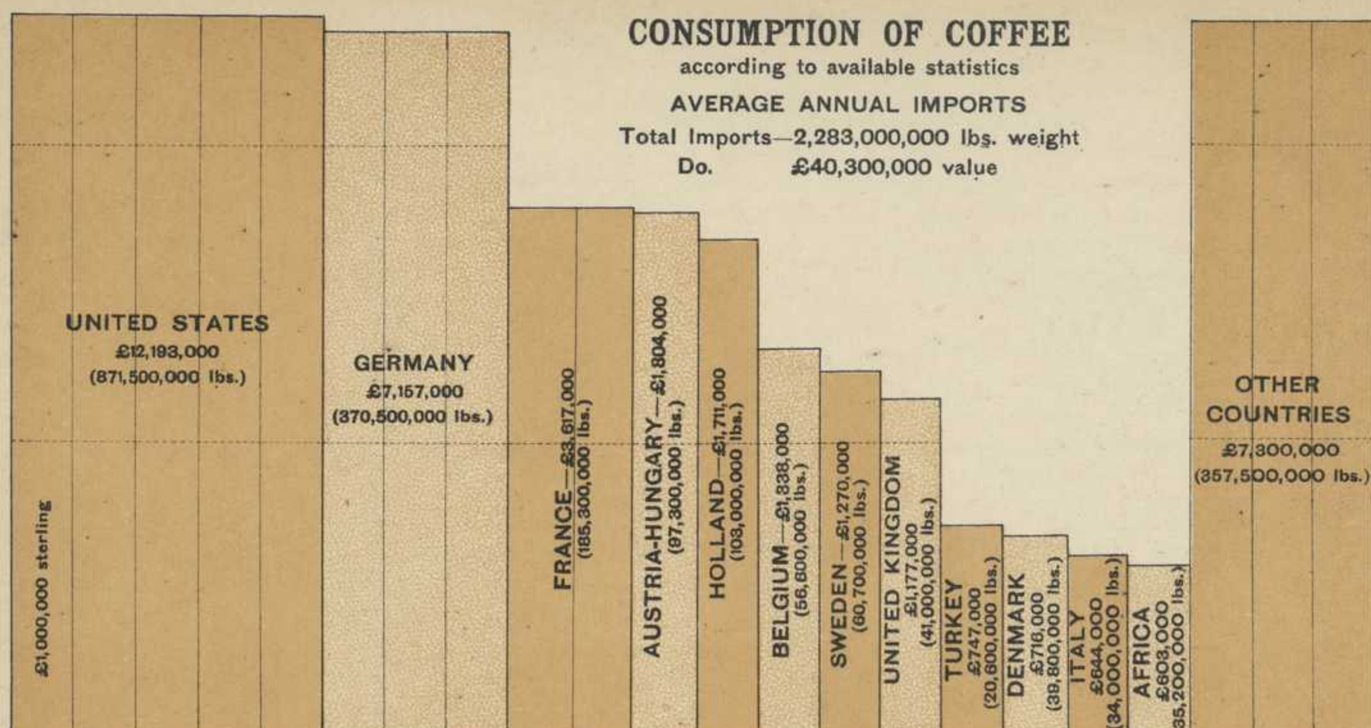




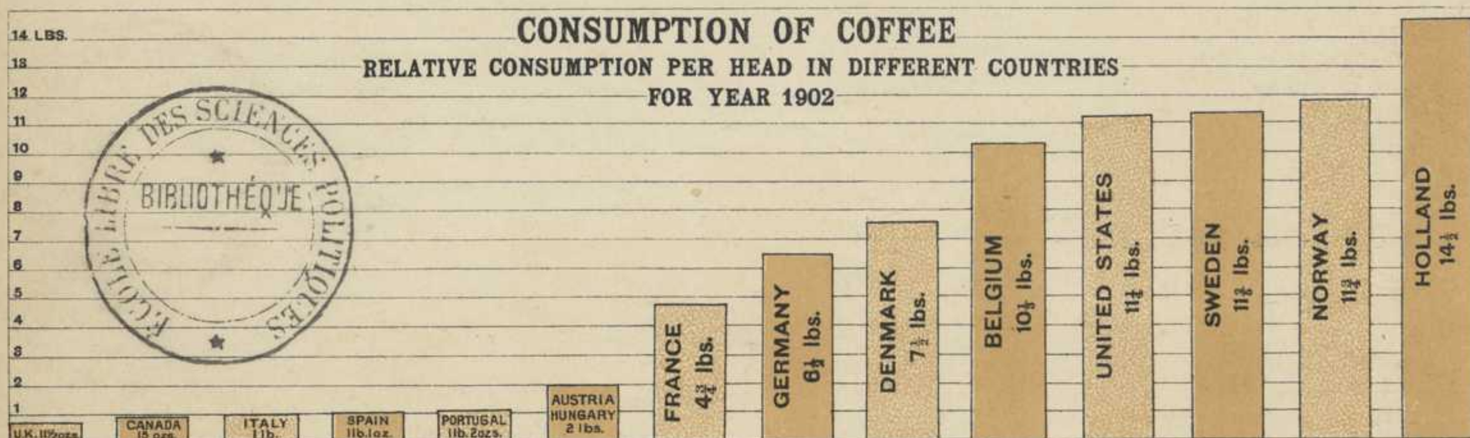



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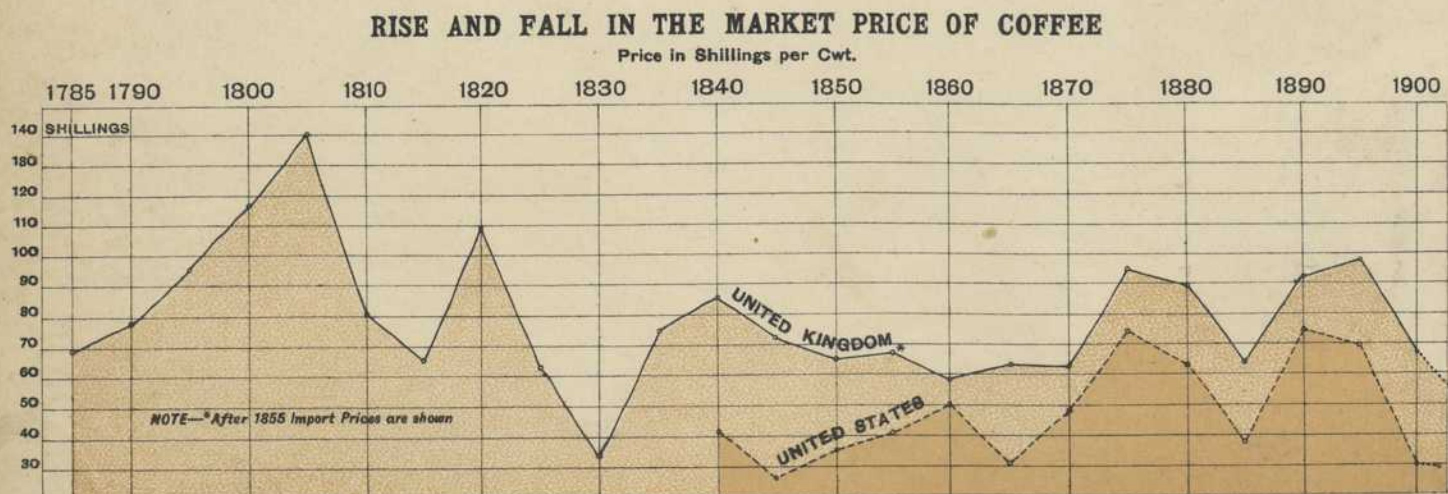

The Annual Imports here represented are the special imports reserved for home consumption. The large quantities absorbed by the United States are very conspicuous. Relatively to population, however, Holland takes the lead, as will be seen from the diagram of consumption per head. Amsterdam is the chief European coffee market and exports largely, and Great Britain also has an important trade. In consumption per head the United Kingdom is last on the list, and Canada also is a small consumer, tea being the favourite beverage in these countries. In Europe the consumption per head, it will be noticed, is less in the southern countries.






## CHIEF SOURCES OF BRITISH SUPPLY OF COFFEE

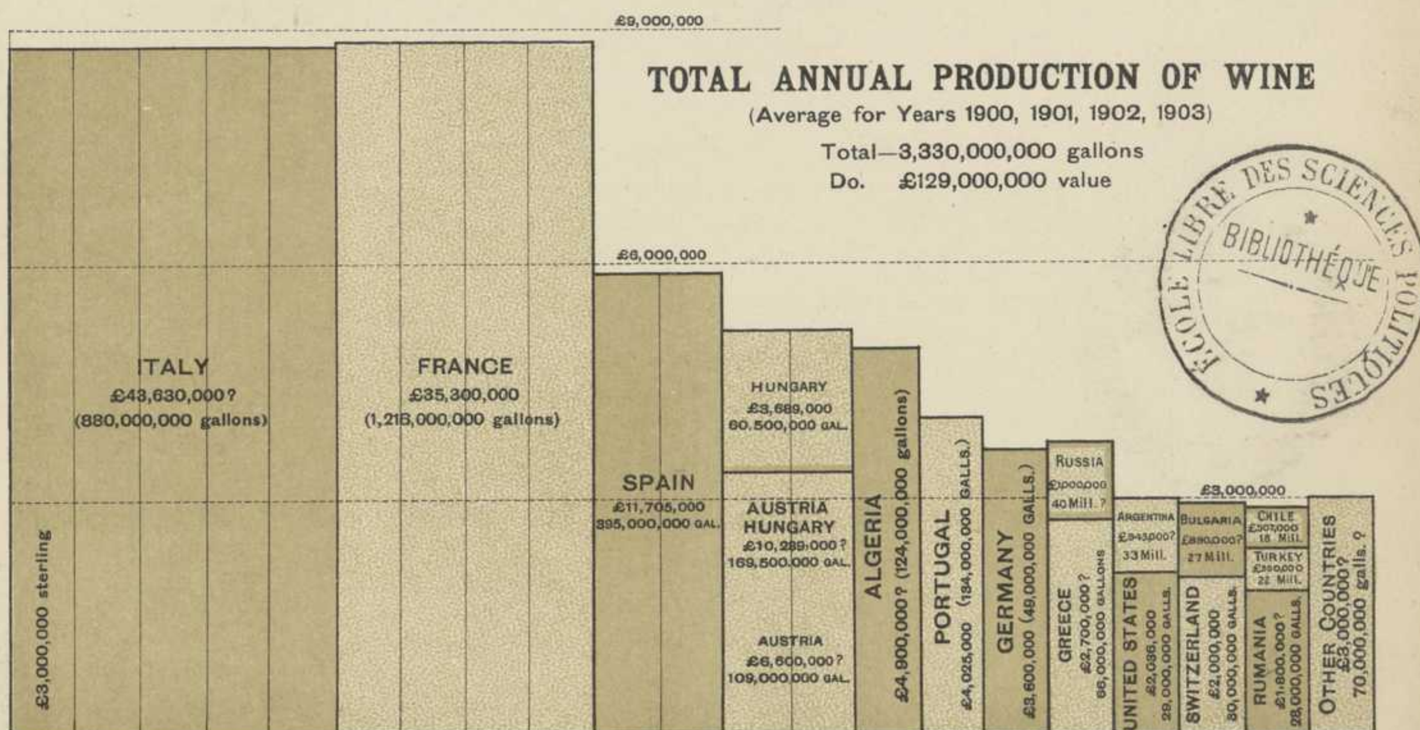
| Brazil | United States | Costa Rica | Germany | Colombia | France | Guatemala | Other Foreign Countries | British Possessions |
|---|---|---|---|---|---|---|---|---|
| 148,000 cwts. or 16·6 % | 109,000 cwts. or 12·4 % | 106,000 cwts. or 12·0 % | 100,000 cwts. or 11·4 % | 66,000 cwts. or 7·5 % | 48,000 cwts. or 5·5 % | 44,000 cwts. or 5·0 % | 93,000 cwts. or 10·5 % | 167,000 cwts. or 19·1 % |




The price of coffee in the United States is less than in the United Kingdom, owing partly no doubt to the superior quality of coffee demanded in a country where so little is consumed and where tea is the beverage of the people. The fall in the price since 1891 is due to over-production.

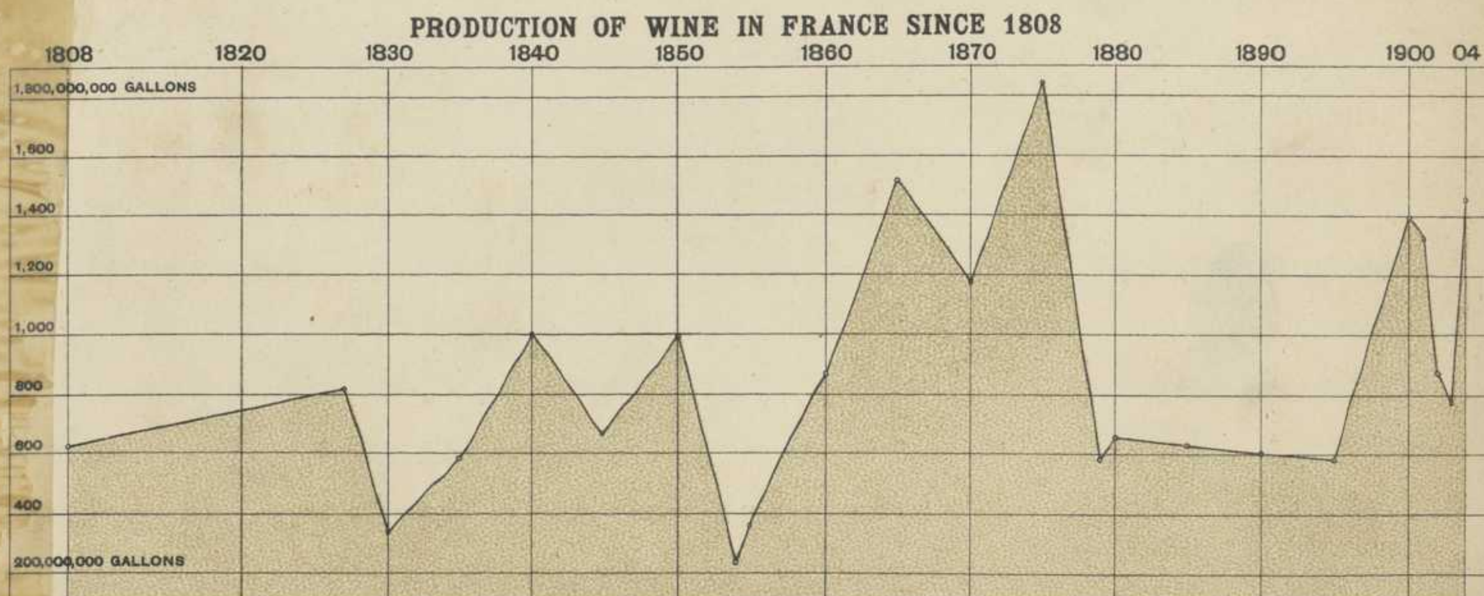
# WINE

**General Summary.**—Wine, properly so called, is the fermented juice of fresh grapes. It was made in the eastern countries of the Mediterranean in very early times, and the vine was introduced into Burgundy by the Romans, probably in the 2nd century, and also into the south-east of England, where wine was made down to the 18th century. At the present time grapes are grown for wine making in France nearly up to the latitude of Paris, and in Germany to lat. 52°, the limit nearly coinciding with the July isotherm of 66° F. The varieties of grapes are numerous, and the flavour and quality of the wine depend also on climate and soil. There are astringent, acid, full-bodied, strong, and thin wines. Red wines are made from dark-skinned grapes and white wines from light-coloured grapes fermented without their skins. Sweet wines contain sugar which has not been converted into alcohol during fermentation, while in dry wines almost all the sugar has been thus converted. Tokay, made from grapes which have begun to dry before being gathered, or *vin de paille*, made from grapes dried on straw, are strong heavy wines. Natural wines contain up to about 17 per cent. of alcohol by volume, but spirits are added to sweet wines to check fermentation, and sometimes sugar is added before fermentation to increase the strength. Port, Madeira sherry and Marsala contain 16 or 17 per cent., while the wines of France have about 10. In the last-named country the wines are of great variety, and those of Bordeaux and Burgundy are well-known. For the *grand vins* the grapes are carefully selected, the second gathering yields an inferior quality, and the last quality is made by pressing out the juice remaining in the pulp after the crushed grapes have been drained. Germany is celebrated for its white wines of the Rhine and Moselle, Austria for its Tokay, and Hungary produces wines, both white and red, which would be better known if the cost of transport did not hinder their distribution. Chianti, Asti, and Capri are some of the best wines in Italy, and Sicily produces Marsala. The Iberian peninsula exports heavy wines—port and sherry, and Madeira the well-known wine of the same name. Of extra European wine-producing countries the most important are the Cape, the United States, and Australia. The vine was introduced into the Cape in 1653, and already in 1710 a small quantity was shipped. Vines grew wild in that part of the continent of America which now forms the United States, and the Norse discoverers named part of the coast Vinland. Wine was first manufactured from native wild grapes in Florida in 1565, and at the present day the Catawba vine yields wine in the state of New York. Spanish grapes were introduced into California in 1771, and during the last 40 years the production of that state has rapidly increased, and is now fully four-fifths of that of the United States. European vines were planted in the Hunter river district, New South Wales, in 1828, and wines are now manufactured in all the states of the Australian continent, but chiefly in New South Wales, Victoria and South Australia. The exports from the two latter have increased in a high ratio during the last ten of fifteen years. For sparkling wines *see* CHAMPAGNE in the List of Commodities.

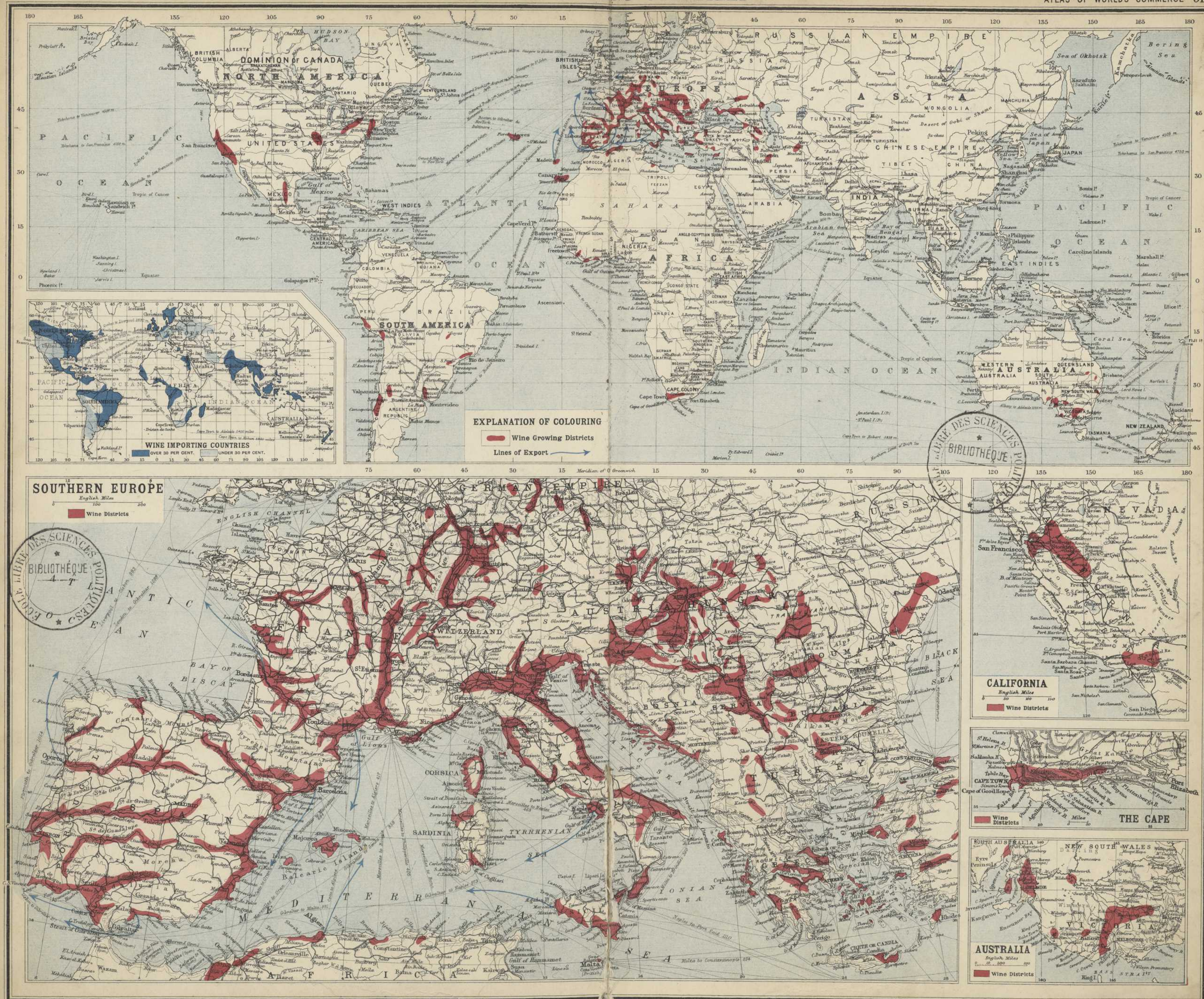




Being constructed on a basis of value, this diagram does not show conspicuously the great preponderance of France. The figures show that this country produces nearly one and a half times the quantity made in Italy.




The line shows how variable the production of wine is, owing to changing seasons, occasional over-production, &c. The great fall was in the fifties, when the vines were attacked by oïdium or mildew, and the production sank in 1854 to a minimum of about 238 million gallons. A small reduction in 1870 was due to the Franco-Prussian war, and a large and prolonged reduction, due to the ravages of the *Phylloxera vastatrix*, commenced a few years later, the smallest quantity being produced in 1879—about 584 million gallons.

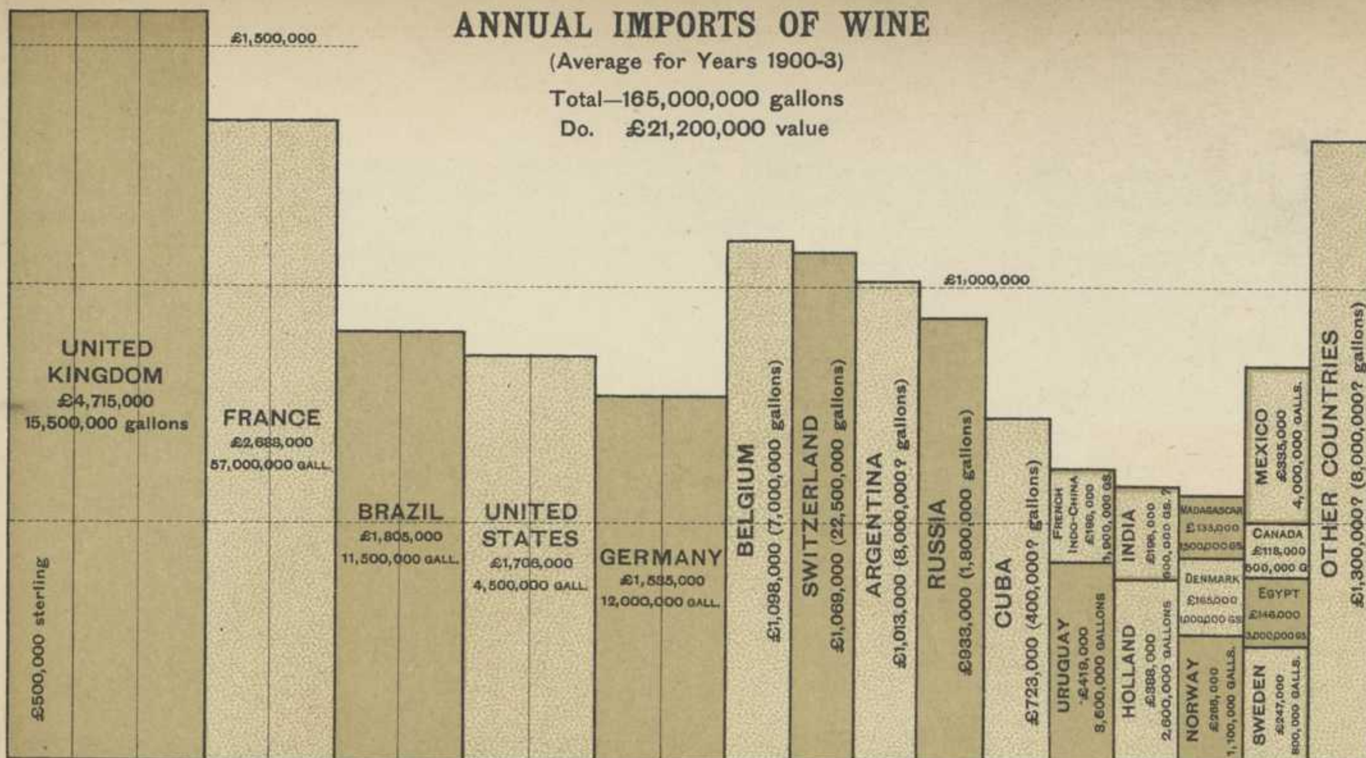



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## ANNUAL IMPORTS OF WINE

(Average for Years 1900-3)

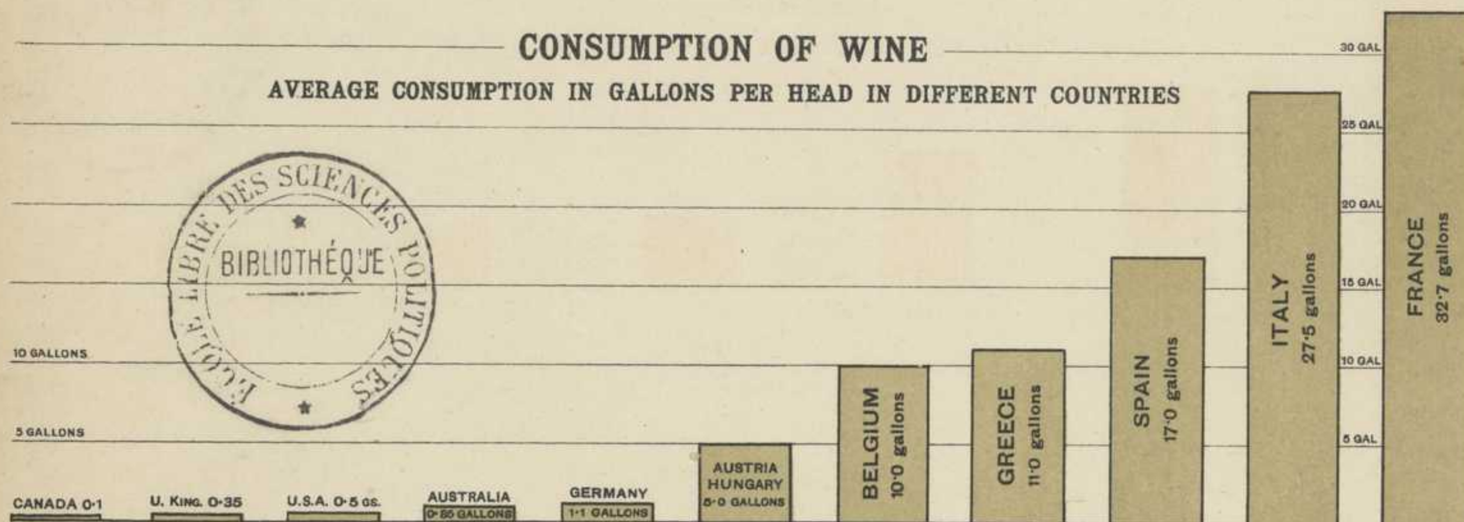
Total—165,000,000 gallons
Do. £21,200,000 value




Note that, though France is the largest producer in the world, it is an importing country second only to the United Kingdom.

## CONSUMPTION OF WINE

AVERAGE CONSUMPTION IN GALLONS PER HEAD IN DIFFERENT COUNTRIES






In France and Italy, where wine is much cheaper than beer, the consumption is very large, while in the United Kingdom and Germany beer and spirits are more generally drunk. In the United States and the Colonies the use of non-intoxicants accounts for the small consumption.

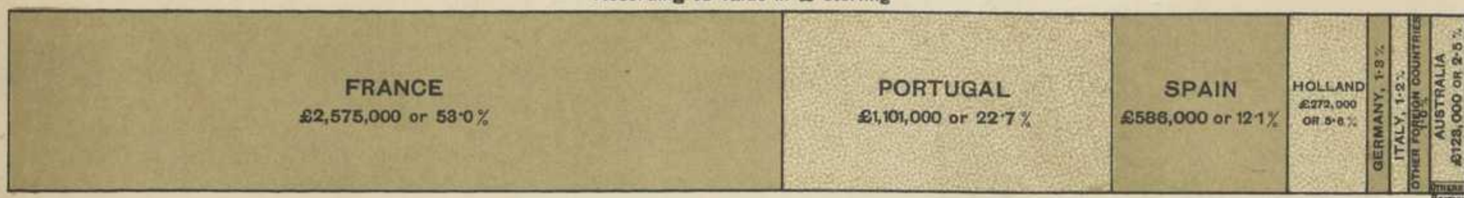
## CONSUMPTION OF WINE IN UNITED KINGDOM

IN PINTS PER HEAD



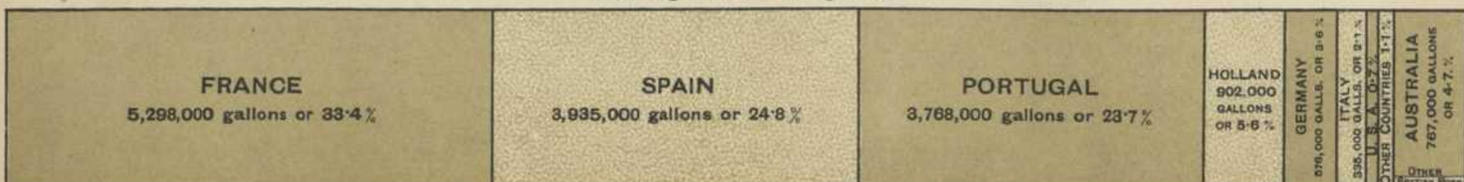

## SOURCES OF BRITISH SUPPLY OF WINE (Average, 1901-3)

According to value in £ sterling




## SOURCES OF BRITISH SUPPLY OF WINE (Average, 1901-3)

According to measure in gallons

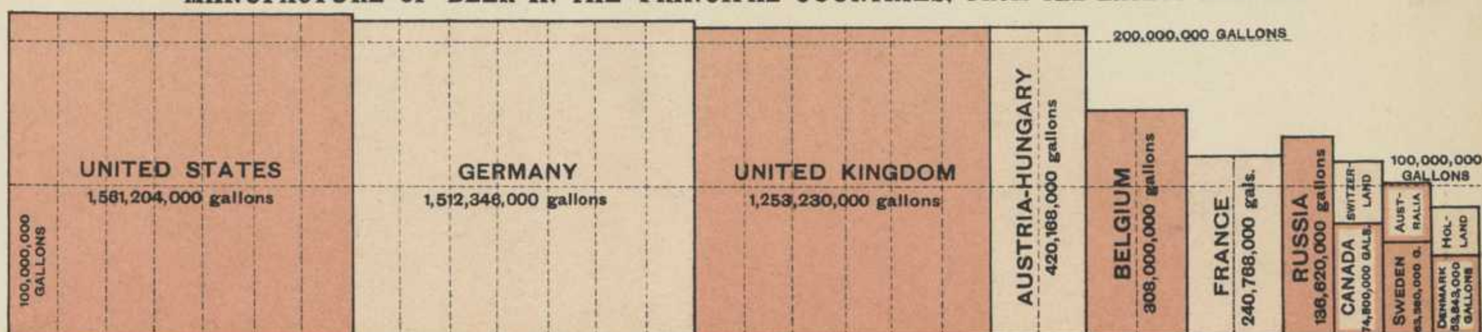



It is interesting to notice that the preponderance of France is shown far more in the value than the quantity of the wines imported. The inference to be drawn is that the light wines of France are less popular than the heavier wines of Spain and Portugal, and that they are more appreciated by those persons who have the means of purchasing the superior qualities.

# BEER.

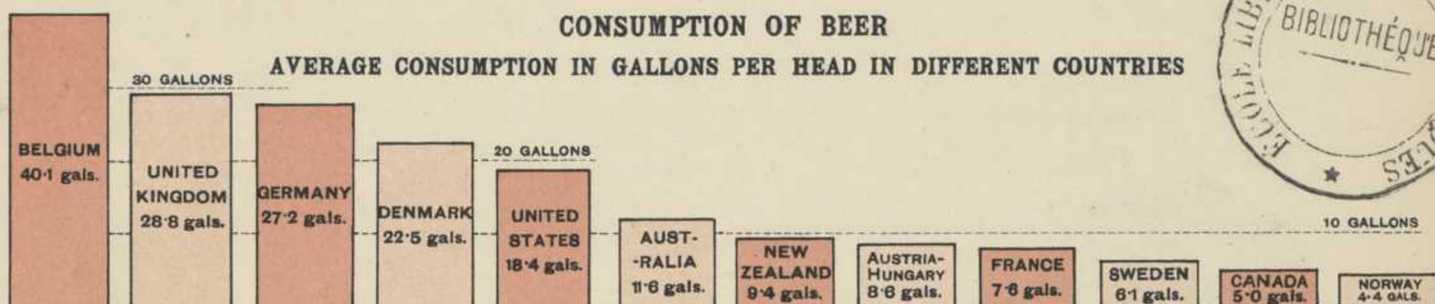
**General Summary.**—A fermented drink made from various cereals and saccharine materials. Barley malt is the best material, but raw grain, including maize, rice and wheat are often used as well as glucose, sucrose, malto-dextrins, saccharine, etc. In Russia rye is the chief grain from which kvass is made. These ingredients are fermented with a varying quantity of hops. Different types of beer are produced by different processes, and the processes in use on the Continent differ considerably from those practiced in the United Kingdom. Much also depends on the water, the saline waters of Burton, and the calcareous water of Dublin rendering those places noted for their ales and porter respectively. Bitter ales and beers are racked into casks in which are placed some hops of very good quality. Mum, a beer made chiefly from wheat meal, and spruce beer from treacle and an extract of spruce fir, are especially German productions.

### MANUFACTURE OF BEER IN THE PRINCIPAL COUNTRIES, FROM THE LATEST RETURNS




In most countries the quantity of beer manufactured has increased; in Germany, on the other hand, the maximum was reached in 1901, and in Austria there has been a little decrease.



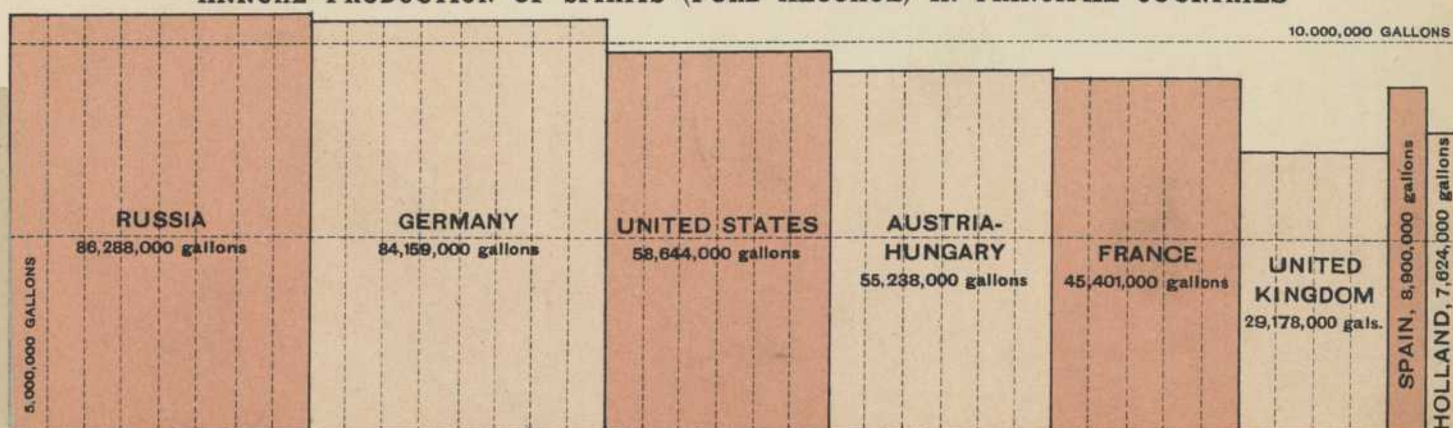



There is a popular impression that more beer is drank in Germany than in the United Kingdom, and this perhaps is true of North Germany, but in the south its place is taken to a great extent by wine. In Austria-Hungary and France, where wine is also plentiful, the consumption is small.

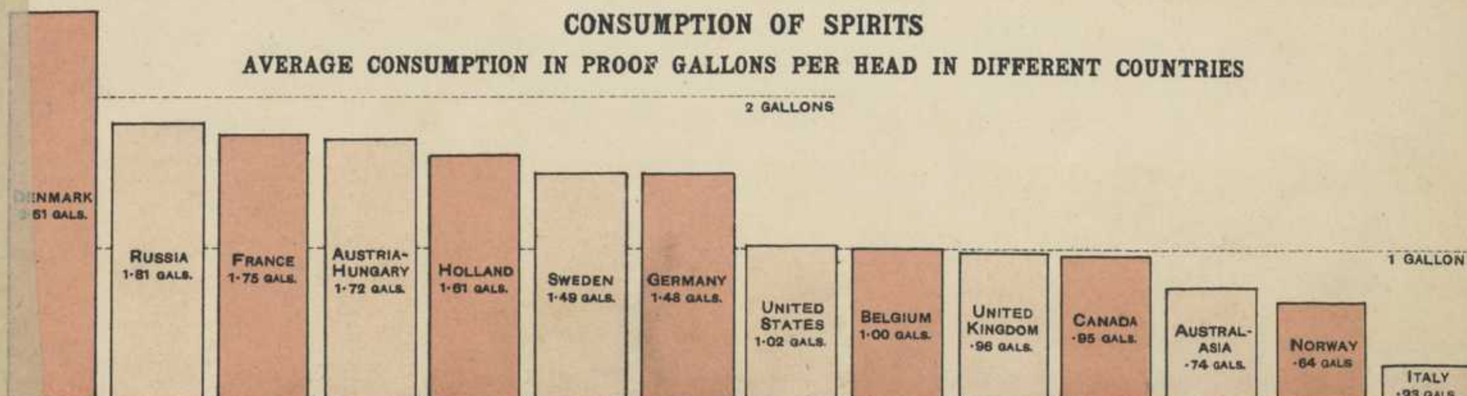
# SPIRITS.

**General Summary.**—The most important spirits—brandy, whisky, gin and rum—have been noticed separately in the List of Commodities. In the diagram below is shown the production of alcohol in the chief countries of the temperate zones, the materials being grapes, grain, potatoes, beet-root, molasses, and other saccharine substances. A considerable portion is used for industrial purposes. The other commercially important spirit is rum, of which between 8 and 9 million gallons are exported annually from the West Indies, and smaller quantities from Mauritius, Réunion, and Queensland, etc. Other spirits, such as Arrack in India and South-eastern Asia, Samshu and Sake in China and Japan, Agave spirit in Mexico, etc., are consumed locally, or are exported in small quantities to neighbouring countries.

### ANNUAL PRODUCTION OF SPIRITS (PURE ALCOHOL) IN PRINCIPAL COUNTRIES




There has been a general increase in the production of spirits in Europe, especially in Germany, a great exporting country, where the increase has been about 22 per cent. since 1890. In the United States the increase has been 70 per cent. in 10 years.




On the whole there is a small reduction in most countries on the consumption of spirits per head. In the United Kingdom the maximum of 1·09 gallons was reached in 1899.

# COCOA & SPICES

## COCOA

Lines of Export



COCOA

COCOA

COCOA

COCOA

## COCOA IMPORTING COUNTRIES

LARGE CONSUMPTION (Over 1 lb. per head)

SMALL CONSUMPTION

## SPICES S.E. ASIA

## SPICES

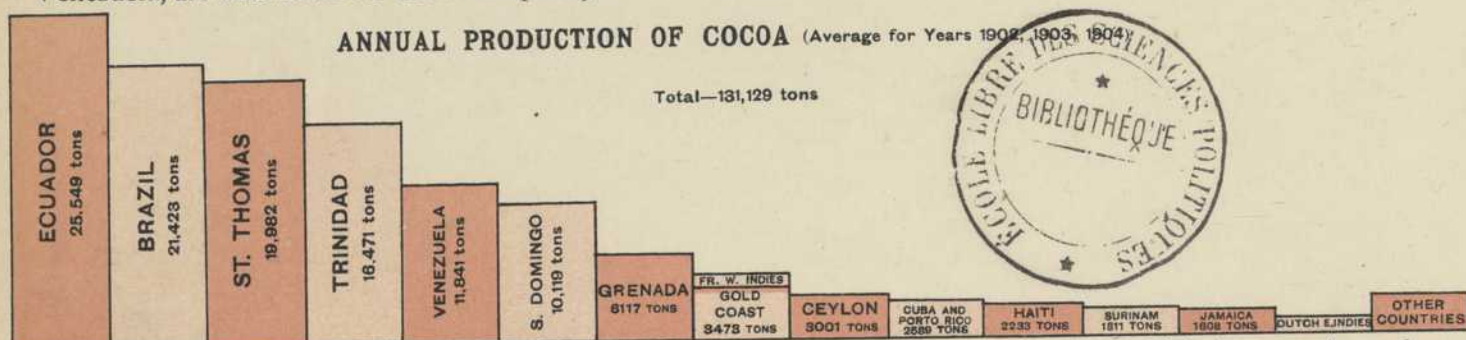
Lines of Export





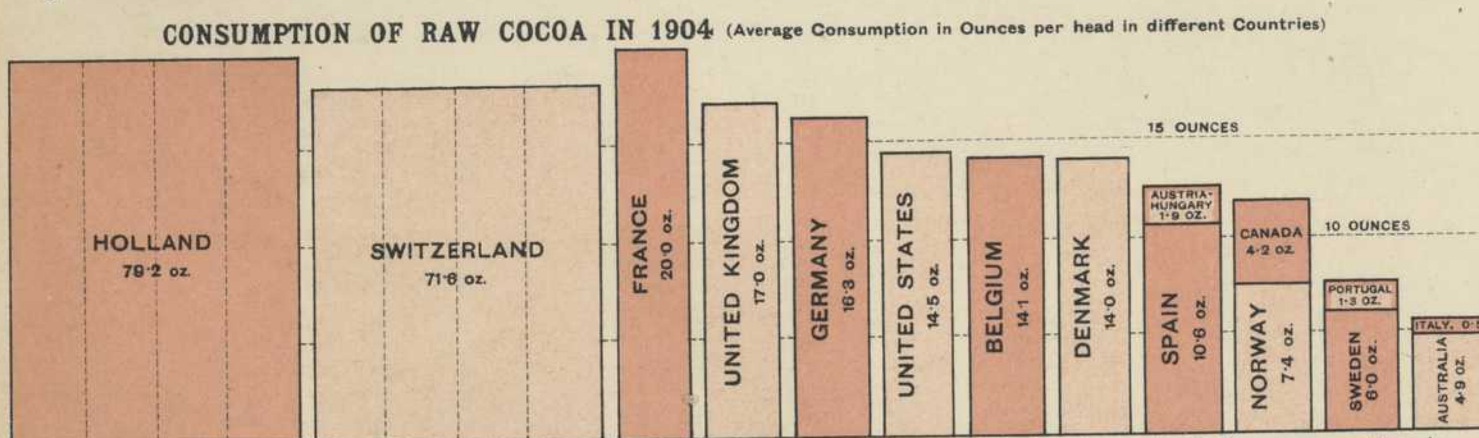
# COCOA.

**General Summary.**—Cocoa, or cacao, is the seeds of *Theobroma cacao*, a tree which grows chiefly in the tropical countries of America, but is also cultivated in the East Indies and parts of Africa. It requires an even temperature of 75° to 82° F. and thrives luxuriantly within 15° of the equator. The tree reaches a height of 40 feet and generally produces its first fruit in its fourth year. It reaches its prime in its twelfth year and continues to bear till its 30th year or even longer. The pod is seven to nine inches long and contains twenty to forty seeds imbedded in a pinkish acid pulp. The chief crops are gathered in May or June and in October or November, but some fruits are ripening all the year round. To prepare them for market, the beans are fermented in shallow pits or in closely sealed barrels or rooms and are covered with red earth which removes the remains of the pulp and tinges the berries red. The nibs are then roasted and ground into a fine paste, and when pure or mixed only with flour or other farinaceous matter are usually known as cocoa, but when sweetened and flavoured with vanilla or other essences, is generally called chocolate. Cocoa contains fully 22 per cent. of nitrogenous food and an alkaloid, theobromime, very similar to caffeine. The oil, of which it contains about 50 per cent., does not turn rancid and is sold under the name of cocoa-butter. Ecuador is the largest producer. The cocoa of Central America, especially that of Soconusco is of excellent quality, but little is exported. The cocoas of Ceylon, and Caracas, Venezuela, are also noted for their fine quality.

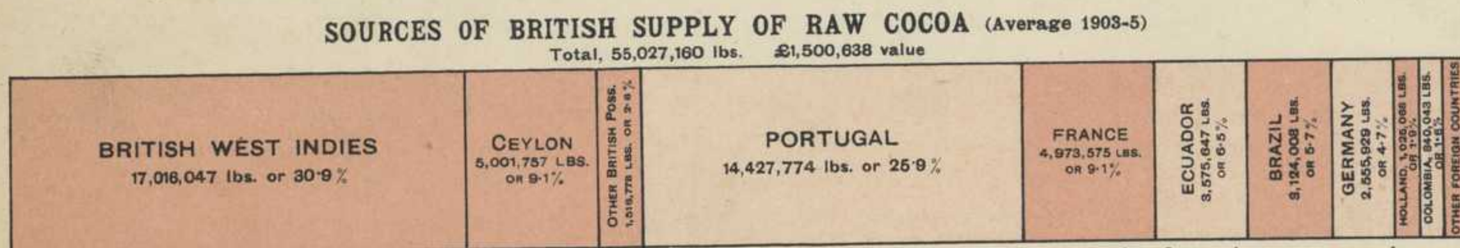




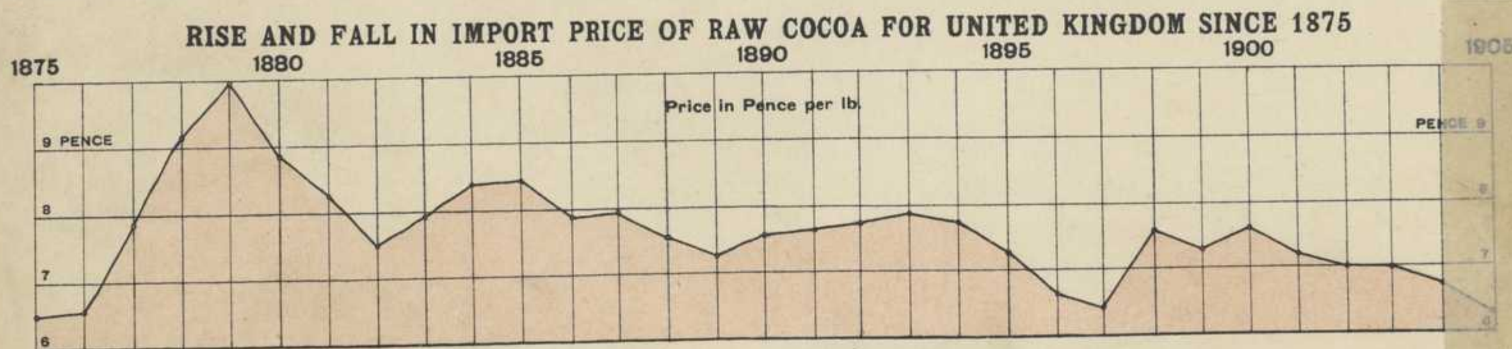

The production of the world has increased by more than 45 per cent. since 1900. This increase has taken place in all countries except the Dutch East Indies, Surinam, and British Guiana, and has been proportionally greatest in the Gold Coast, Kamerun, and Togoland, Venezuela, Cuba, and Porto Rico.



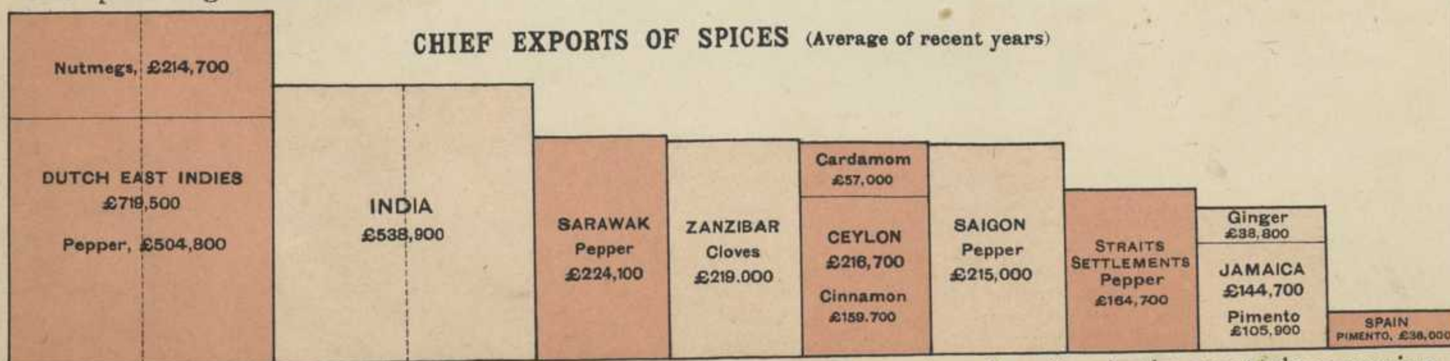

The consumption of cocoa has also largely increased. The quantities per head retained for consumption in Holland and Switzerland, indicate the importance of cocoa in the industry of those countries. The largest absolute quantities are absorbed by the United States, Germany, and France.




The most marked changes are the larger imports from British West Africa (nearly four times as much as in 1901 though still too small to appear in the diagram) and the great fall in British Guiana imports.



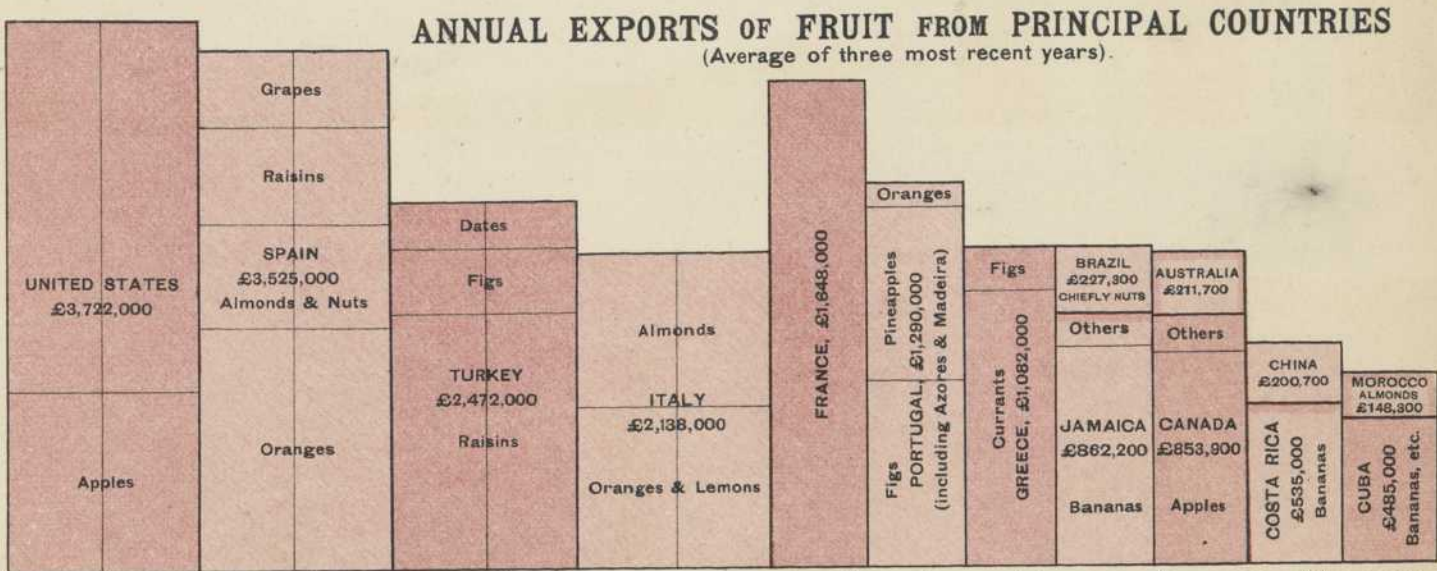

**SPICES.**—The chief spices, pepper, long pepper, capsicums, pimento, nutmeg, mace, vanilla, cinnamon and cassia, cloves, ginger, etc., are described in the List of Commodities. The diagram below shows the exports of the chief producing countries.



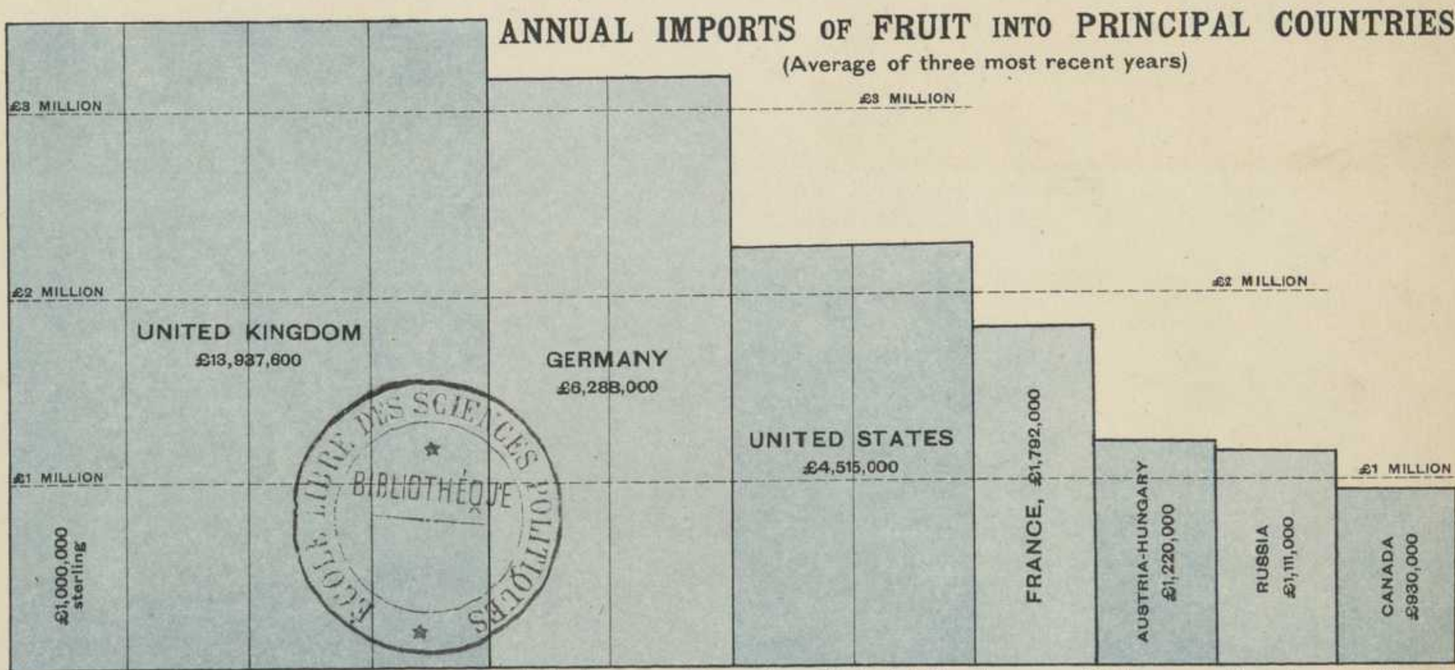

The above are the exports from the chief producing countries only. Zanzibar is the great clove-growing country, the production in some years being equal to the world's consumption. A diagram of the production of vanilla is inserted in the List of Commodities.

# FRUIT.

**General Summary.**—The fruits which enter most largely into commerce are those which can be gathered before they are dead ripe, such as apples, oranges and bananas, and those which dry without decaying, such as raisins and currants, nuts, almonds, dates, and figs. Grapes also will keep for some time, but pears, peaches, and other stone fruit do not acquire their full flavour unless they ripen on the tree. Fresh currants, gooseberries, strawberries, etc., are liable to be crushed in carrying. Oranges, which are exported in large quantities, grow in both hemispheres from about 37° north latitude to 35° south. Mandarin oranges, of which the Tangerine is a variety, are grown chiefly in Sicily, Spain, and Jamaica, and the bitter orange is found in Mediterranean countries and America. The leaves of the orange yield an essential known as *essence de petit grain*, and the flowers a still more fragrant essence called oil of Neroli. Small unripe oranges are used in making curacoa, and rosoglio is made in Italy from Mandarin oranges. Bananas flourish in all tropical countries, but are exported to Europe almost solely from the Canaries, Central America, and the West Indies. Almonds come chiefly from Spain, Italy, and Morocco; raisins from Greece, Asia Minor, and Spain; nuts from Italy and Spain. Large quantities of fruit which will not keep long fresh are preserved in various ways. France exports prunes and prunelloes, and also Bosnia and the United States, where there are also large factories for tinning pineapples, peaches, pears, etc. Fruits are also candied in sugar or boiled down into pulp, especially apricots. Apples and other kinds of fruit are more particularly described in the List of Commodities. Of late some fresh fruit has been sent to Europe from South Africa and Argentina, and this is the more valuable as it comes in the winter season.

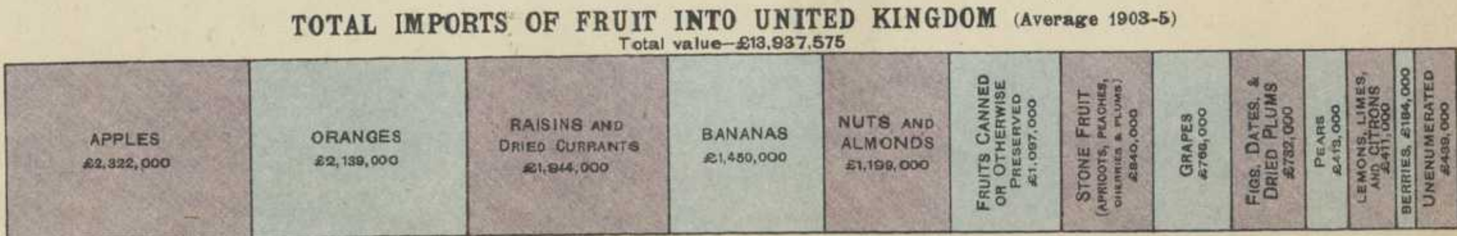



The chief feature of the fruit trade during recent years has been the great increase of exports of bananas, especially from the West Indies and Central America. The most important fruit in the United States is the apple, the average crop for the last few years being 133 million bushels. Canned fruit and prunes are also important exports, the latter increasing. Apples are also the most important fruit in Canada where the crop increased from $8\frac{1}{2}$ million bushels in 1891 to $18\frac{1}{2}$ in the next census year, 1901. There has been for several years over-production of currants in Greece, fostered by ill-advised measures intended to keep up the price.





Forty years ago the value of the fruit imported into the United Kingdom was little more than two million sterling, so that in this period it has increased more than six times Germany grows a large quantity of fruit, but imports southern fruits. Of the United States imports, bananas account for about a third of the total value, and lemons come next in value.




In the above diagram the value of the various kinds of fruit is the basis. If weight be considered, oranges, as shown on the adjoining page, come first, followed by apples, which, however, are probably closely pressed by bananas.

# APPLES, BANANAS, ORANGES, DATES, &c.















### APPLES, SOURCES OF BRITISH SUPPLY (Average 1903-5)
Total—3,945,329 cwts.

United States, 1,954,500 cwts. or 49·5%
Canada, 1,333,900 cwts. or 33·8%
Australia 246,900 cwts. or 6·3%
Portugal 143,600 cwts. or 3·6%
Belgium 110,300 cwts. or 2·8%
France, 1·7%
Holland, 1·0%
Others, 1·8%

### ORANGES, SOURCES OF BRITISH SUPPLY (Average 1903-5)
Total—5,699,510 cwts.

Spain (including Canaries), 5,036,200 cwts. or 88·4%
Asiatic Turkey 252,400 cwts. or 4·4%
Italy 194,200 cwts. or 3·4%
Br. W. Indies, 1·5%
Other Countries 128,500 cwts. or 2·3%

The imports of this fruit reached their maximum, 6,518,107 cwts. in 1902 and fell in 1905 to 5,068,526 cwts. Smaller quantities were received in this year from Spain and Italy. The imports from the West Indies are increasing, but are still comparatively small. Lemons, limes, and citrons have also fallen off.

### BANANAS, SOURCES OF BRITISH SUPPLY (Average 1903-5)
Total—4,245,314 bunches

Canary Is., 2,151,256 bunches or 50·7%
Costa Rica, 1,288,570 bunches or 30·3%
Brit. West Indies 792,891 bunches or 18·7%
Other Countries

In 1900, the first year in which separate returns were made of bananas, the quantity imported was only 1,289,442 bunches, whereas in 1905, it was 5,737,914. A still further increase took place in 1906. During the same period the price has fallen from 8·53 to 6·17 shillings per bunch. The Canary fruit is the best.

### DATES, SOURCES OF BRITISH SUPPLY (Average 1903-5)
Total—418,510 cwts.

Asiatic Turkey, 358,409 cwts. or 85·6%
France 20,812 cwts. or 5·0%
Persia 16,908 cwts. or 4·0%
Brit. E. Indies 14,038 cwts. or 3·4%
Egypt, 1·4%
Other Countries



### RAISINS AND CURRANTS, SOURCES OF BRITISH SUPPLY (Average 1903-5)
Total—1,787,284 cwts.

Greece, 1,073,598 cwts. or 60·1%
Asiatic Turkey 384,074 cwts. or 21·5%
Spain 293,177 cwts. or 16·4%
Holland, 1·1%
Others, 0·9%

Greece sends most of the currants and some raisins; Turkey and Spain raisins only.

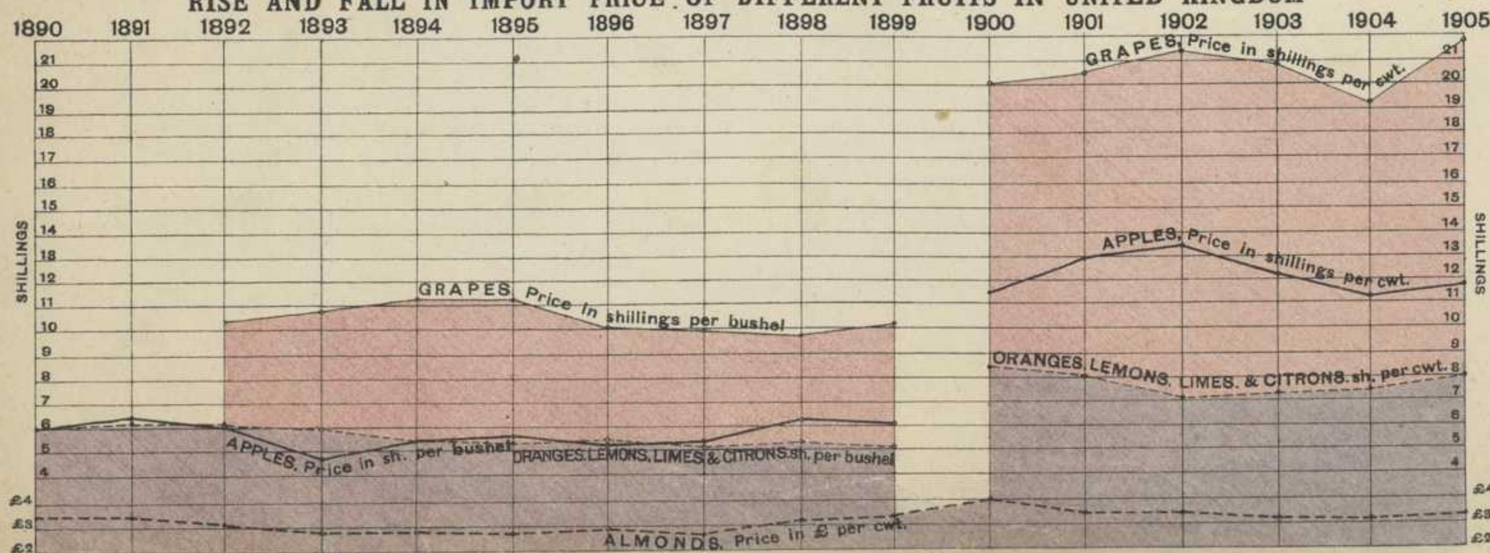
### NUTS AND ALMONDS, SOURCES OF BRITISH SUPPLY (Average 1903-5)
Total—923,489 cwts.

France, 327,408 cwts. or 35·5%
Spain (including Canaries) 224,414 cwts. or 24·3%
Ceylon 141,252 cwts. or 15·3%
Brit. West Indies 55,598 cwts. or 6·0%
Brazil 52,633 cwts. or 5·7%
Morocco 34,814 cwts. or 3·8%
Italy 32,570 cwts. or 3·5%
Belgium, 1·8%
Portugal, 1·2%
Others 30,977 cwts. or 3·4%

### SOURCES OF BRITISH SUPPLY OF FRUIT, Canned or otherwise preserved (Average 1903-5)
Total—1,051,781 cwts.

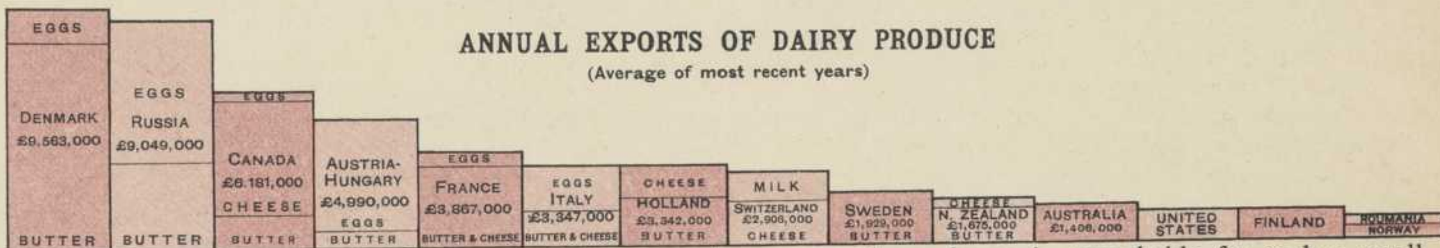
United States 293,651 cwts. or 27·9%
Italy, 251,915 cwts. or 24·0%
Spain 178,649 cwts. or 17·0%
Straits Settlmts. 150,475 cwts. or 14·3%
France 50,136 cwts. or 4·8%
Canada 44,598 cwts. or 4·2%
Australia & New Zealand 42,393 cwts. or 4·0%
Others 40,024 cwts. or 3·8%

### RISE AND FALL IN IMPORT PRICE OF DIFFERENT FRUITS IN UNITED KINGDOM

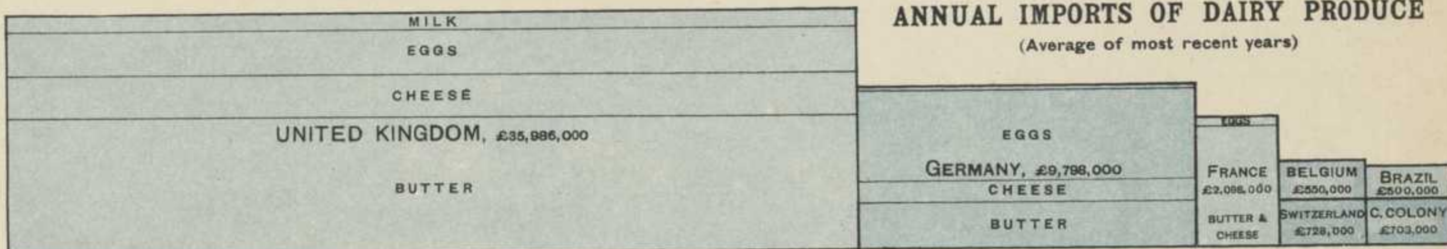


# DAIRY PRODUCTS.

**General Summary.**—The articles here included under the term dairy products are butter, cheese, eggs and milk. The first three have been articles of commerce for a long time, but in increasing quantities as the demand in the crowded countries of Europe, more particularly the United Kingdom and Germany, has increased and swifter vessels have transported them from greater distances, while the development of dairy farming in new countries furnishes a cheap supply at all times of the year. Cheeses may be divided into two kinds, soft and hard, to the former of which belong cream cheeses and many of the fancy cheeses manufactured on the continent, such as Camembert, Brie, Neuchâtel, etc. These keep only for a short time and can be exported only to countries at no great distance. Hard cheeses will keep for months, and are the object of a considerable trade. Cheddar is the kind which figures most largely in commerce, being exported in large quantities from Canada and the United States. Holland exports Gouda and Edam cheeses; France Gruyère and Roquefort; Switzerland, chiefly Gruyère; and Italy, Gorgonzola and Parmesan. Eggs are now brought from even as far as Canada, and are used in calico-printing and other industries, as well as for food. Milk cannot be carried far in a fresh state and the trade in this article is limited, though of considerable importance in a few countries, notably Switzerland and Norway. Condensed milk, sweetened or unsweetened, came into general use between 1860 and 70, and milk is also preserved in cans and dried into a powder. Besides butter, large quantities of margarine are manufactured and consumed, but this article is not included in the diagrams, nor is margarine cheese.



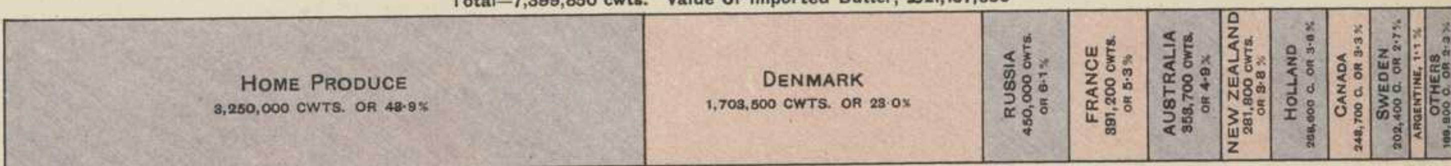

Denmark is one huge dairy-farm and its preponderance, as above shown, is remarkable for such a small country. By far the greater part of the butter shipped from Russia comes from Siberia. France appears also in the diagram of imports, exporting fancy cheeses and importing hard kinds, and importing eggs from Italy and other countries. Holland deals largely in eggs, but does not produce enough for home consumption. The United States exports less than 9 per cent. of its dairy products and is placed low down in the diagram.




The chief importing countries, are here seen to be the United Kingdom and Germany. Of butter, eggs and cheese, the home production, as shown in the diagrams below, is less than the imports. The value of imported milk exceeds one and a half million sterling, but the quantity is insignificant compared to the home production. Switzerland imports butter, while it exports cheese and condensed milk.

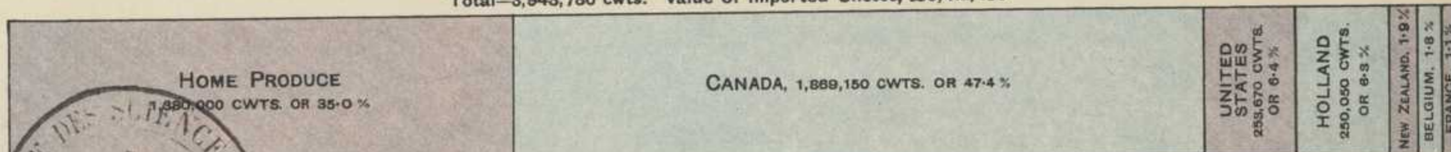
## BUTTER, SOURCES OF BRITISH SUPPLY (Average 1903-5)

Total—7,399,850 cwts. Value of Imported Butter, £21,167,500




## CHEESE, SOURCES OF BRITISH SUPPLY (Average 1903-5)

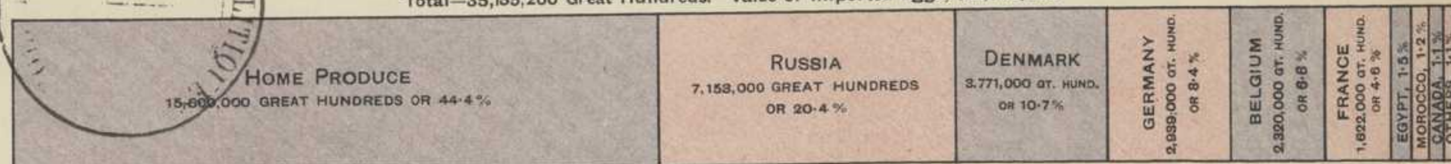
Total—3,943,780 cwts. Value of Imported Cheese, £6,412,430

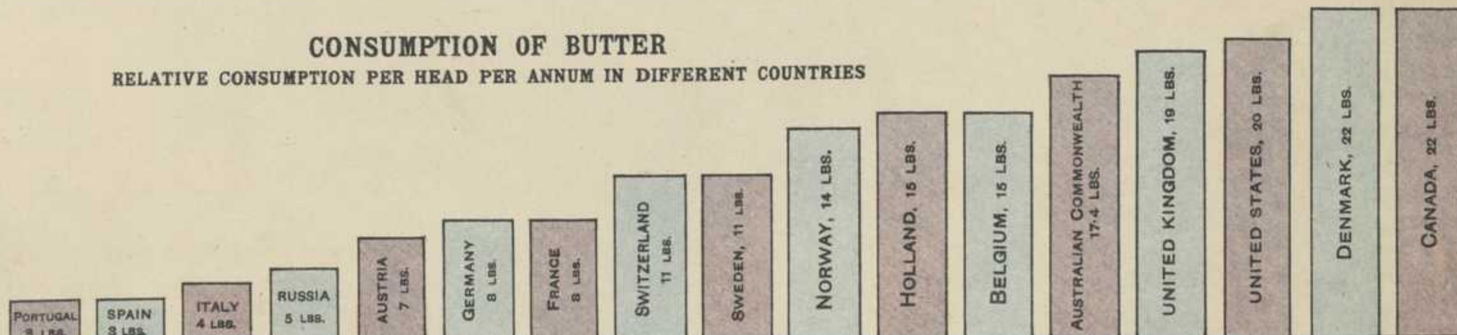




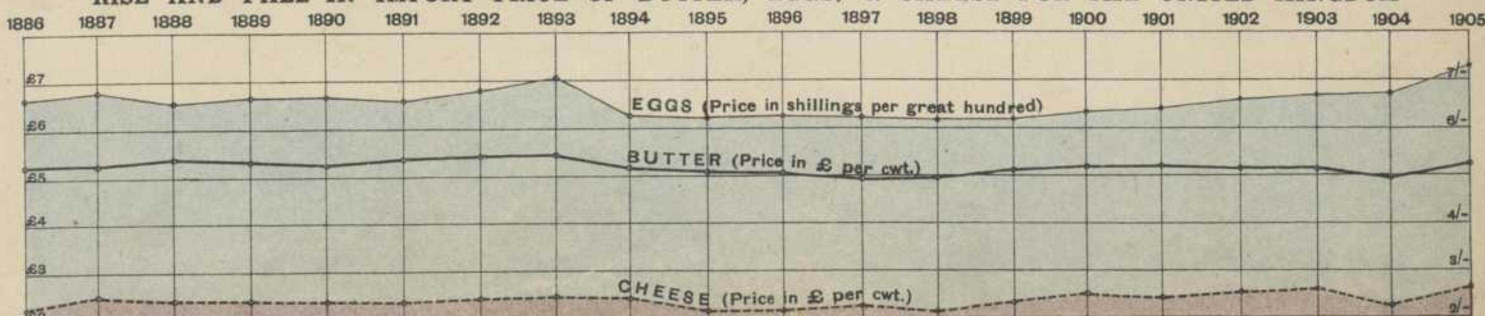

## EGGS, SOURCES OF BRITISH SUPPLY (Average 1903-5)

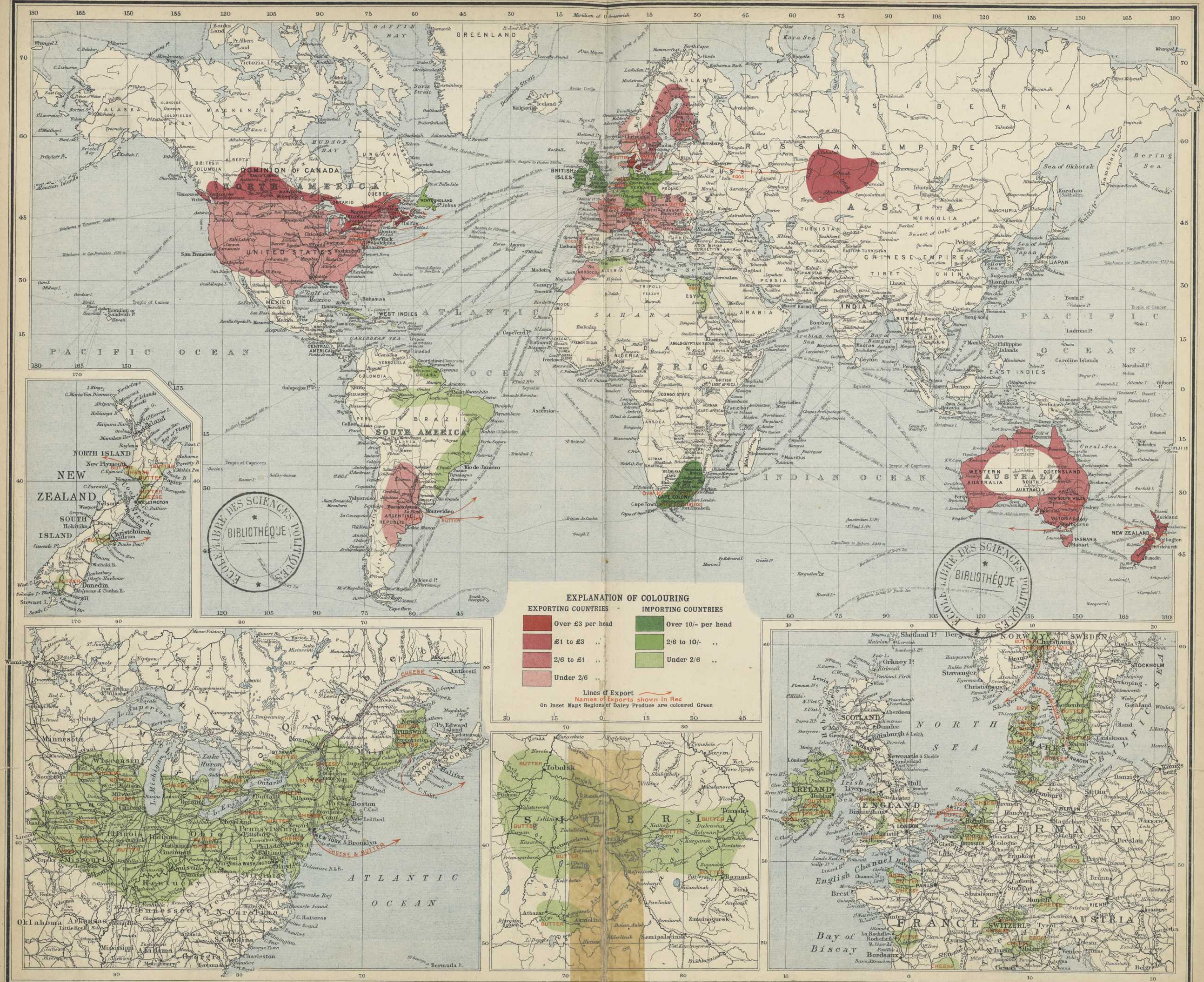
Total—35,135,260 Great Hundreds. Value of Imported Eggs, £6,720,203




The consumption would be more nearly equal in the more northern countries, if margarine were included, which is largely manufactured in Germany, Holland, etc. In warmer countries animal fat is a less necessary article of diet, and in southern Europe oil takes to a great extent the place of butter.

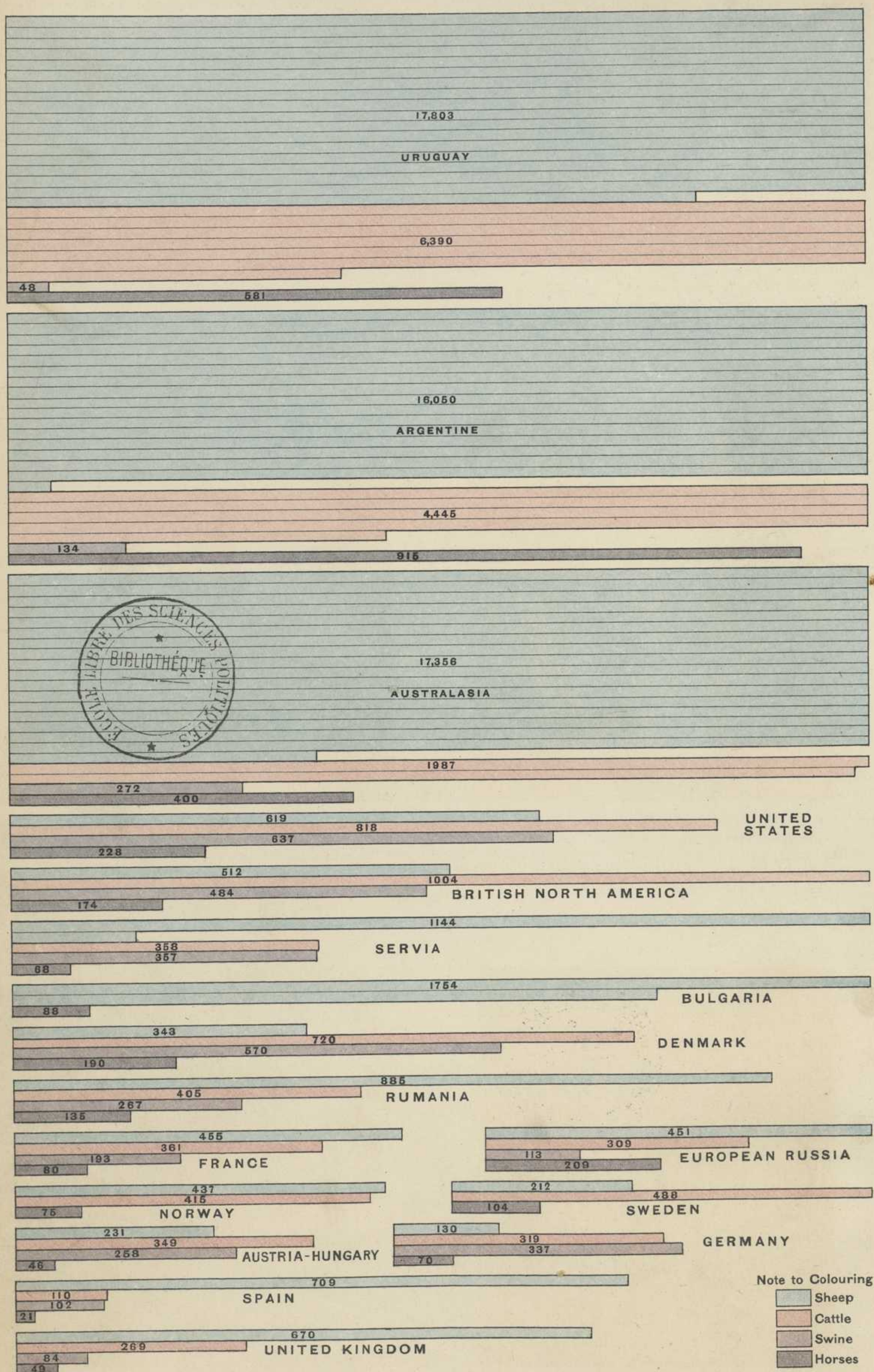





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# DOMESTIC ANIMALS IN PRINCIPAL COUNTRIES

NUMBER OF ANIMALS PER THOUSAND PERSONS IN POPULATION



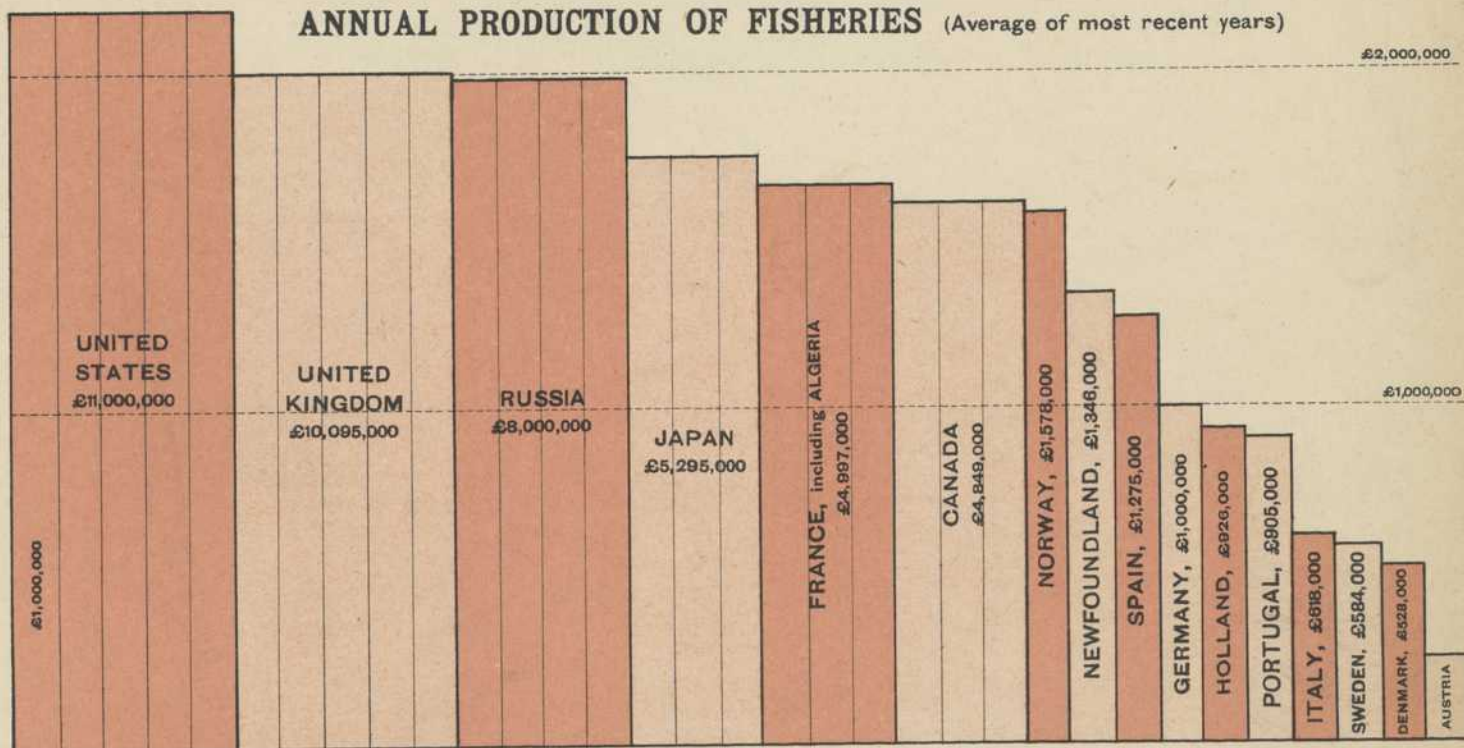


The enormous number of sheep relative to population in the wool-producing countries is strikingly apparent. In the United States swine, as well as cattle are numerous, the preparation of beef and hog products being very large. Of the latter Denmark is also a large exporter. In Europe, Bulgaria and Servia stand out conspicuously as sheep-grazing countries.

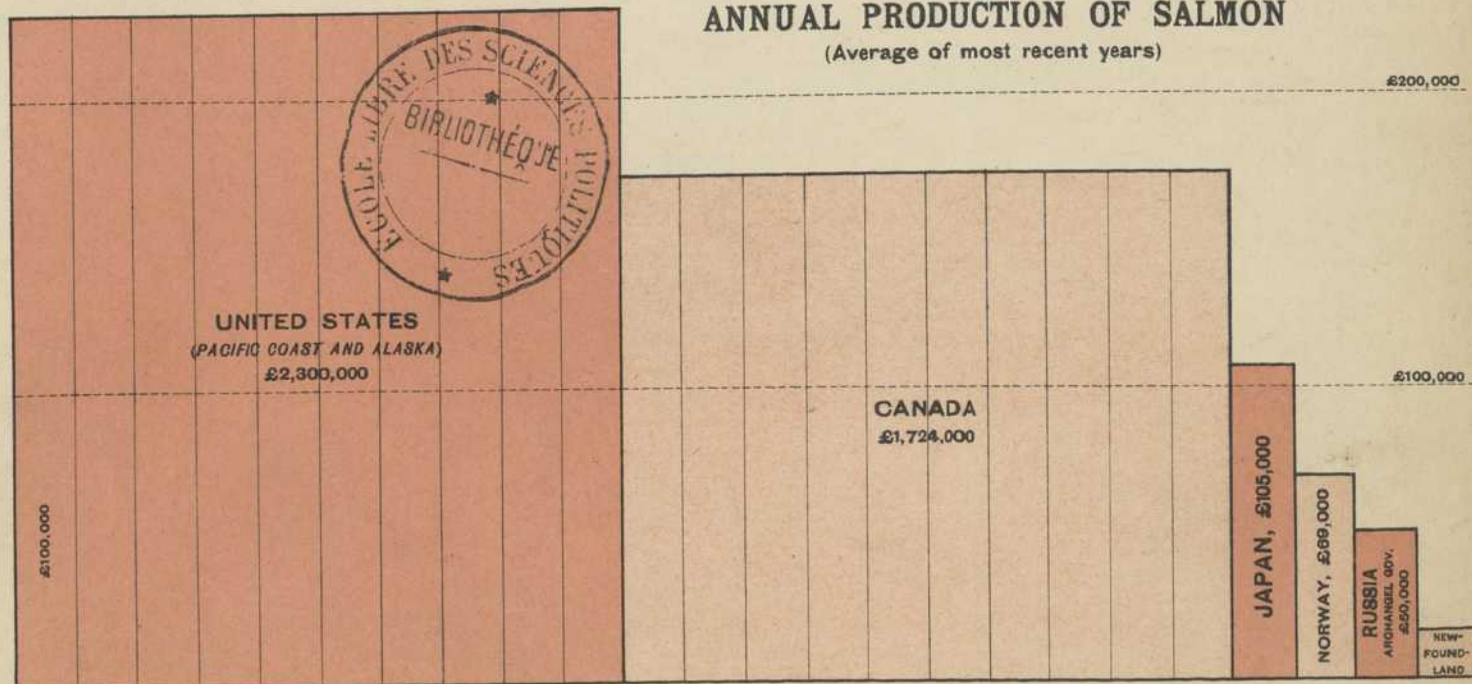
*N.B.*—Each narrow division extending all across the page represents an animal to each person.

# FISH.

**General Summary.**—Fish is a cheap form of food owing to the proportion of nitrogenous matter it contains, and therefore fishing is pursued more or less in all parts of the world, but more especially in temperate climates where the fish are of better flavour and can be preserved in various ways. In Northern Europe, herrings, haddock, mackerel, and cod, are the most common kinds. Soles and pilchards are caught off the English coasts, sardines, anchovies, and tunnies in the Mediterranean. In America, the banks of Newfoundland are noted for cod, and on the United States coast, large quantities of cod, ling, alewives, haddocks, etc., are salted and dried, while sardines and anchovies are preserved in oil. Salmon and trout are caught in rivers and along the coast, being very plentiful in Scotland and Norway. The largest hauls, however, are obtained in the United States, Alaska, and British Columbia. In the rivers of Oregon, and Washington, the supply is maintained by the distribution of fry from hatcheries. In Australia, the fishing industry is not at present of much importance, except the pearl-oyster fishery (see Plate 151), but there are several species of cod in Australian waters, and other fine flavoured fish as the snapper *(Pagrus unicola)* of the Bream family, and a grey mullet, while Tasmania has the Trumpeter *(Latris hecateia)* and the Barracouta *(Thyrsites atun)*. Beche de mer is exported to China from the coast of Queensland. Japan has fisheries of considerable value, and exports large quantities, while in Northern and Eastern Siberia fish is the chief article of food among the native tribes. Salmon are plentiful along the Pacific coast, and three or four years ago a quantity was brought to Germany from Nikolaiyevsk on the Amur. In tropical countries the fisheries are of comparatively little importance and cured fish are often imported. Besides food fishes the sea yields large quantities of other commercial products. Besides pearls and mother-of-pearl, already mentioned, coral for ornamental purposes is obtained off the coast of Italy (see Plate 157) and latterly in Japan, and sponges (see diagrams and List of Commodities), seal-skins (see Plate 124), whale-bone (see List of Commodities), and oils of whales, seals, cod-fish, menhaden, etc. (see Plates 173 to 175) support a large trade.




The quantity of fish caught is continually increasing. In the United Kingdom the increase has been 57 per cent. by weight, and 60 per cent. in value during the last fifteen years. Denmark and Belgium have increased the value of their fisheries in a still larger ratio. For Holland the statistics are incomplete, and only the value of the herrings landed at North Sea ports, and of the fish landed at Zuider-Zee ports can be given. Holland is a large exporter of oysters.





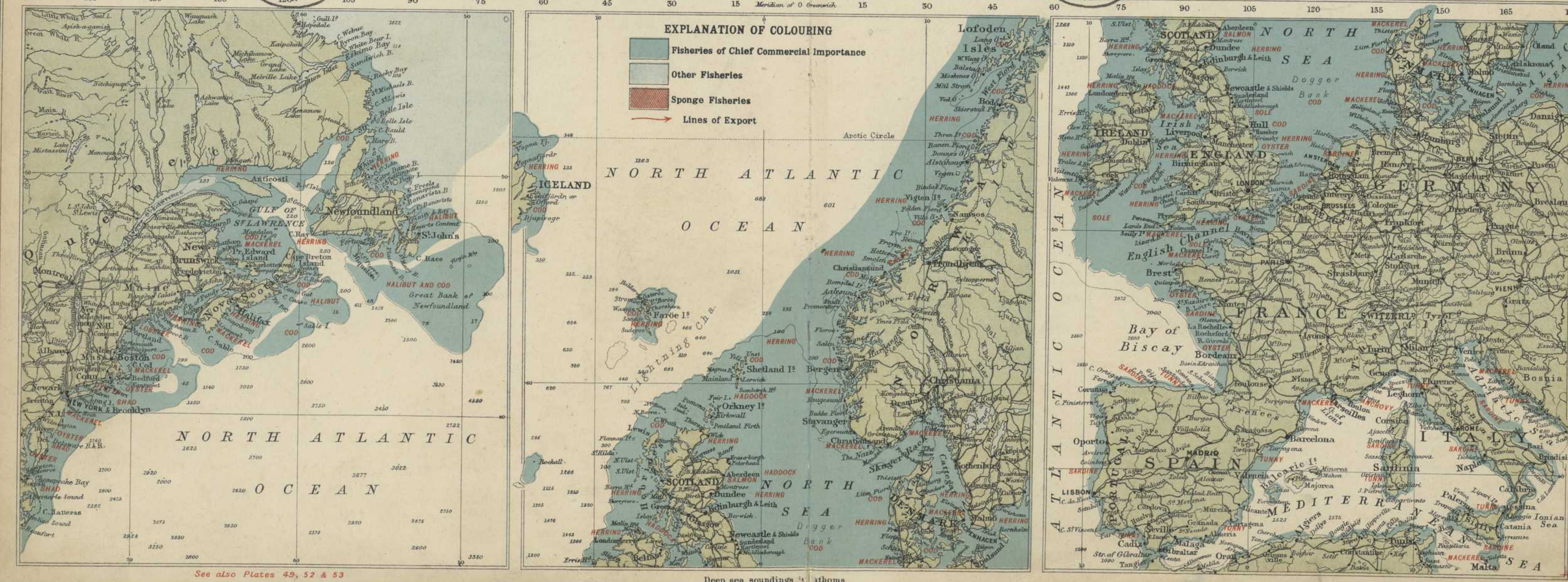
More than two-thirds of the salmon caught on the Pacific coasts of the United States are taken in Alaska. In Canada the haul has been much less in recent years. The pack in British Columbia reached a maximum of 1,236,156 cases (48 one-lb tins in each) in 1901, and this season (1905-6) it is not expected to exceed 400,000 cases. In Newfoundland (with Labrador) there is also a large decline. Compared to the American salmon fisheries those of Europe are insignificant. Those of the United Kingdom are no doubt the most important, but there are no statistics. In 1905 the weight of salmon carried by rail in Scotland alone was more than double the Norwegian catch. In the German rivers and the Rhine in Belgium the catch has fallen to insignificant quantities with the increase of navigation.

# DISTRIBUTION OF FISHERIES



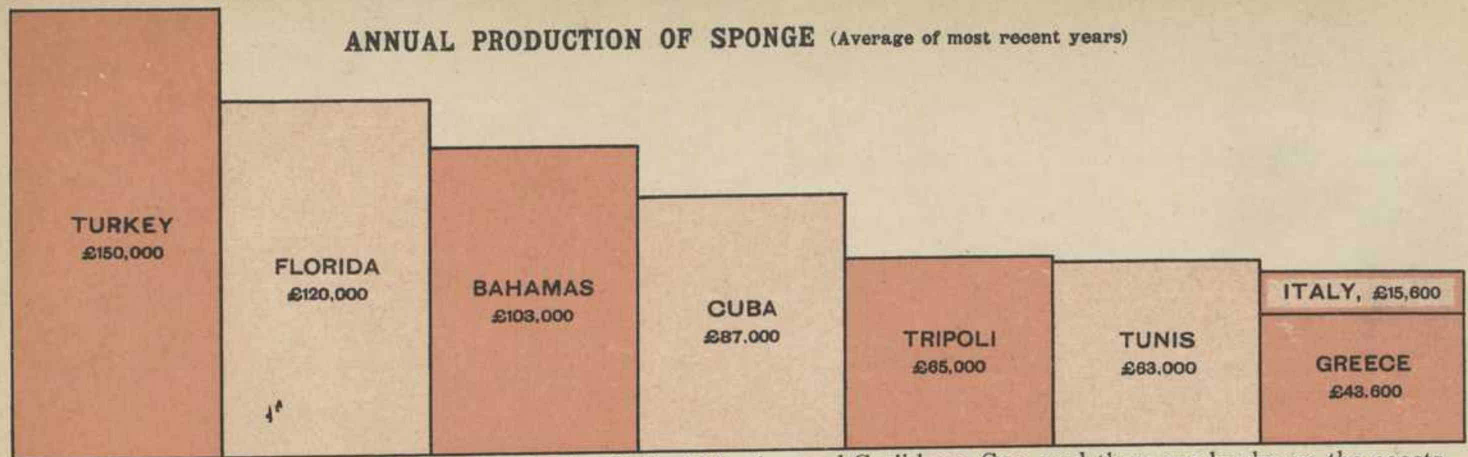







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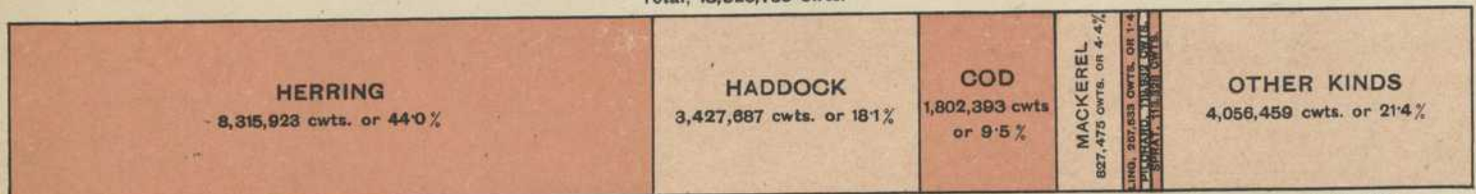
## ANNUAL PRODUCTION OF SPONGE (Average of most recent years)




The fishing of sponges is spreading in the Gulf of Mexico and Caribbean Sea, and there are banks on the coasts of Central America still unexploited.

## QUANTITIES OF THE CHIEF KINDS OF FISH (excluding Salmon and Shellfish)
### LANDED ON THE COASTS OF THE UNITED KINGDOM (Average 1902-4)

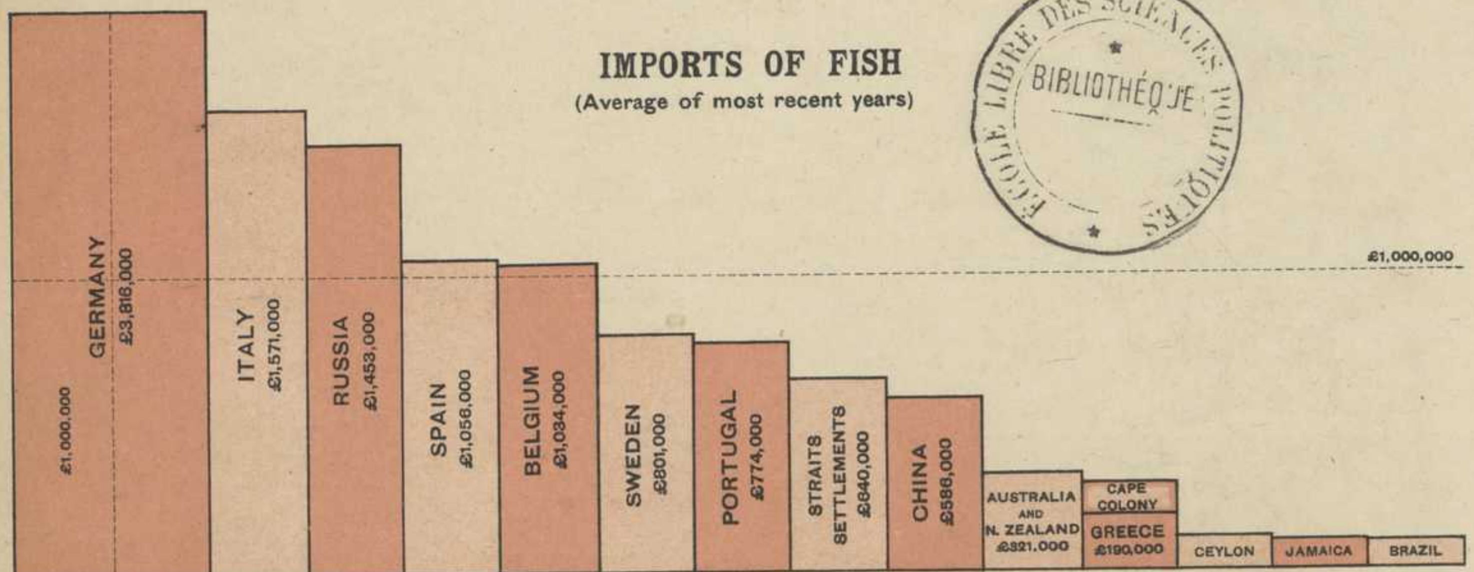
Total, 18,920,730 cwts.




Herrings have always been the most plentiful kind, and the catch has increased about 65 per cent. in fifteen years. Of haddock the increase has been over 50 per cent., and of cod 120. Pilchards show the largest proportional increase, namely, 187 per cent.

## IMPORTS OF FISH
(Average of most recent years)

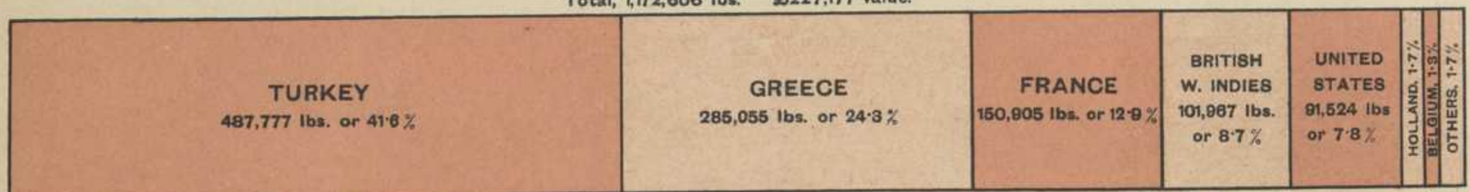





The fisheries of Germany are not very productive though showing considerable progress, and the fisheries of Russia are small compared to its large area. A part of the importation shown above is due to an exchange of products, anchovies, sardines and tunnies being sent north from the Mediterranean, while salt cod, ling, etc. are imported into Roman Catholic countries.

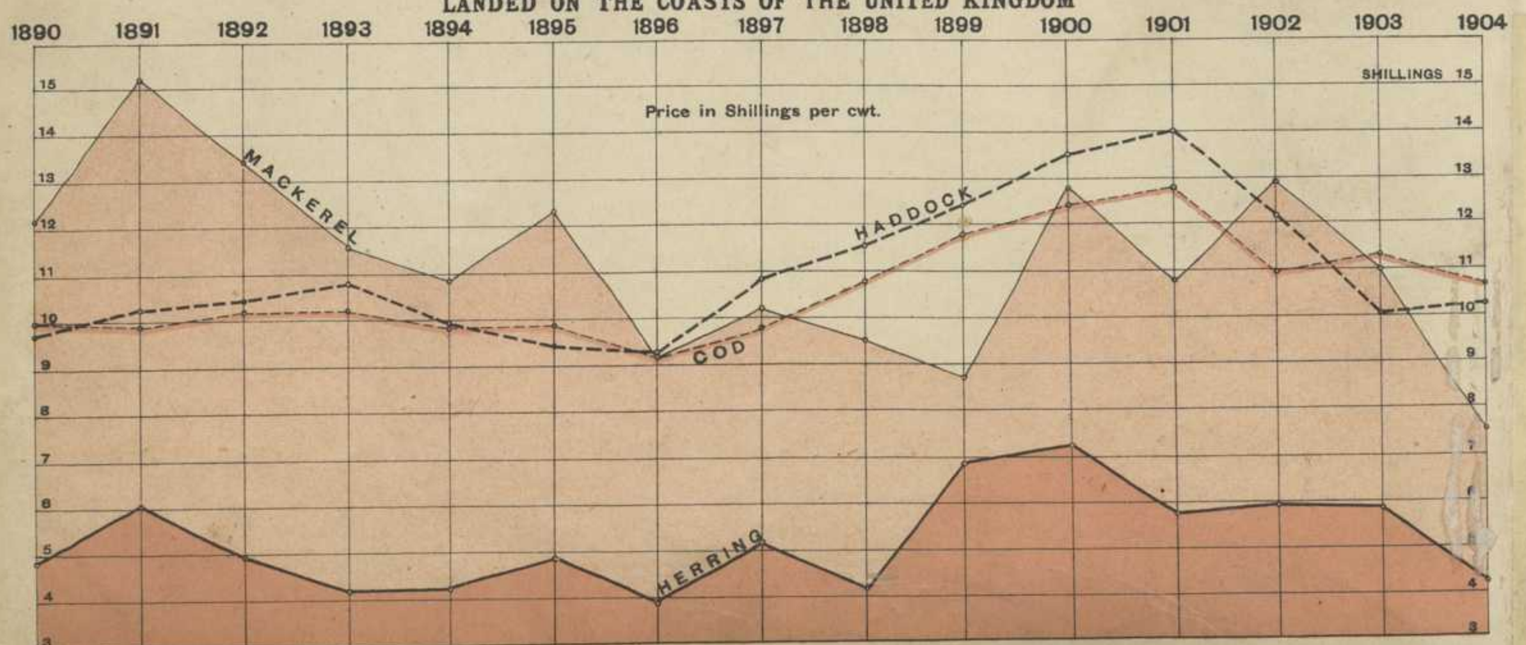
## SOURCES OF BRITISH SUPPLY OF SPONGE (Average 1903-5)

Total, 1,172,606 lbs. £227,177 value.



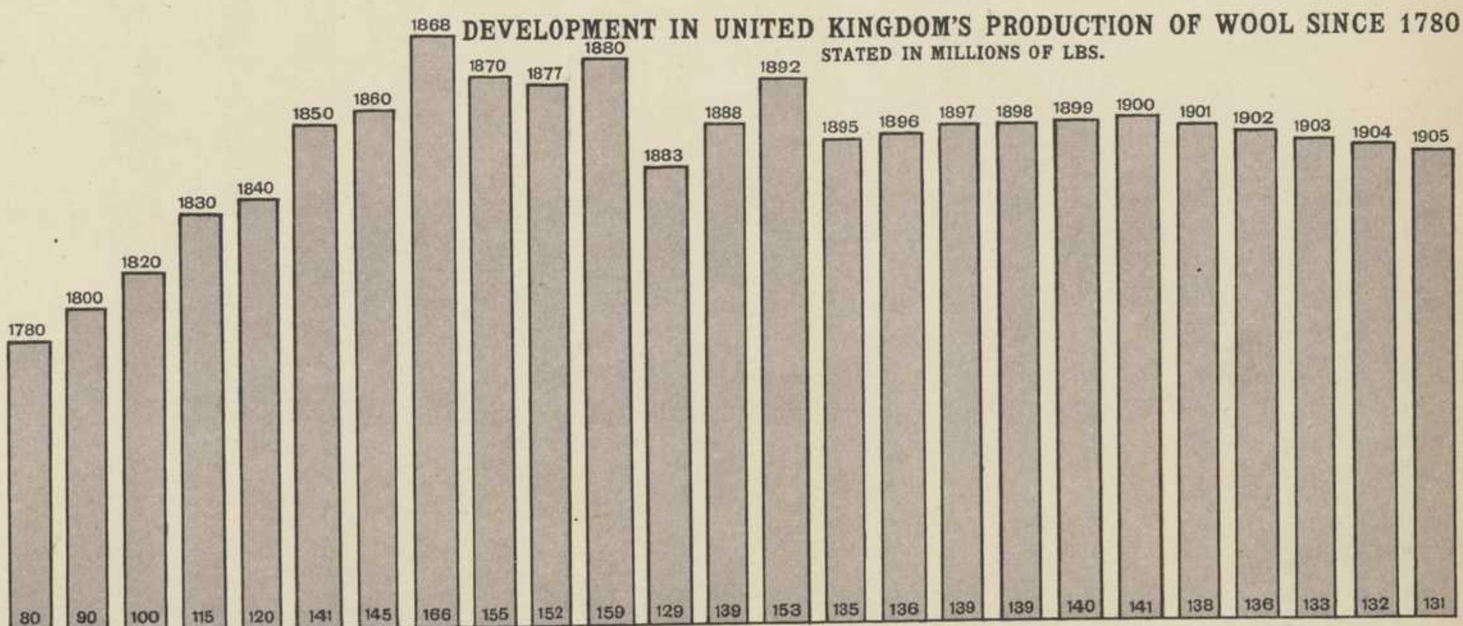

The imports from France were smaller in 1905 than in previous years, and those from Greece were much larger than in 1904. There were no imports from European Turkey where fishing has been prohibited.

## RISE AND FALL IN THE MARKET PRICE OF THE MORE IMPORTANT KINDS OF FISH
### LANDED ON THE COASTS OF THE UNITED KINGDOM



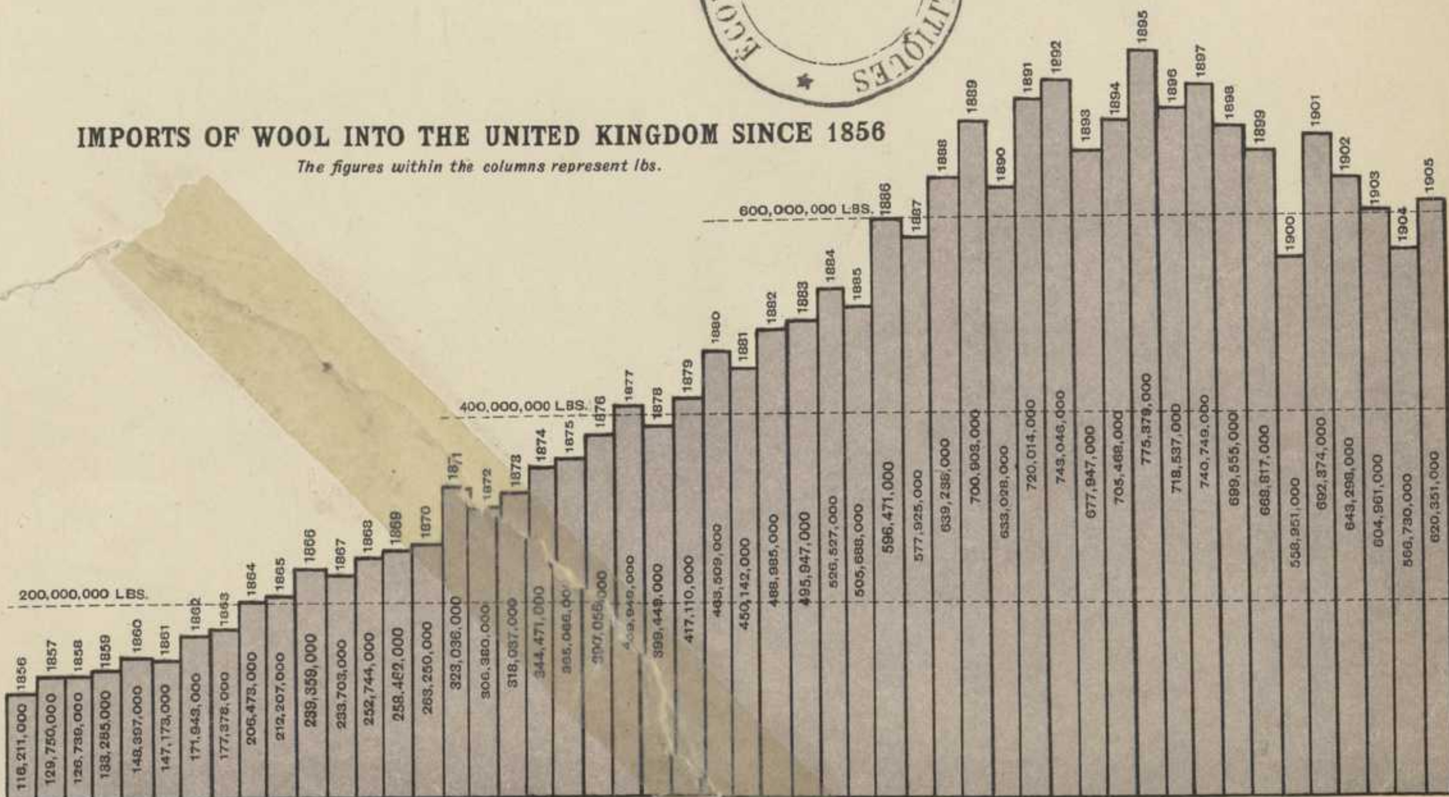
# WOOL.

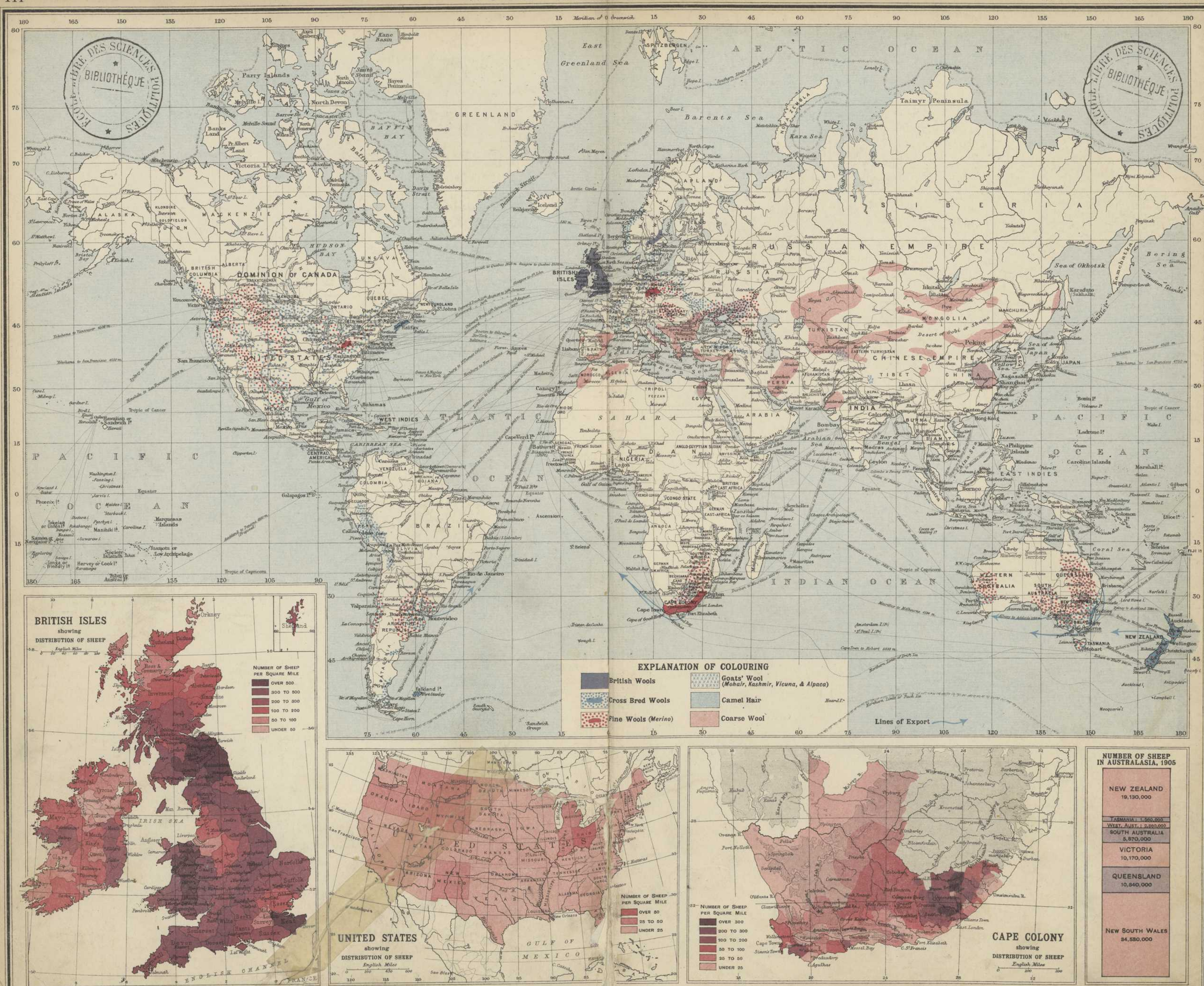
**General Summary.**—The fleece of different breeds of sheep varies widely in character. The wool of the merino sheep is noted for its fineness, elasticity and felting power, and this breed, of Spanish origin, has been introduced into many countries and frequently crossed with native breeds. The chief merinoes of Europe are the 'electoral' wool of Saxony and the wools of Prussian Silesia and Bohemia. In the exports from the southern hemisphere—Australia, the Cape, and Argentina—merino formerly predominated, but the percentage of clean cross-bred wool is now about 50 (51·8 in 1904 and 49·2 in 1905). The mutton of the merino sheep is poor, and the growth of the frozen meat trade has favoured the rearing of cross-breeds, which also are hardier. In England, where the meat is a more important product, the chief wool-bearing breeds are the long-stapled Lincoln and Cheviots, the Leicester, and the short-woolled Southdown. Long-stapled wool was formerly combed and the fibres laid as nearly as possible parallel, and was then spun into worsted, while short wool was carded and used in making milled or fulled cloths, but now wool of all lengths may be either combed or carded, and the difference between combing and carding wools is less marked. Wool in its natural state contains a variable proportion of dirt and grease, and much of it is exported in this state. A little is washed, while some is scoured, whereby the grease, called yolk or suint, is removed as well as the dirt. This treatment causes a considerable loss in weight, and the imports in 1905 into Europe and North America would probably yield about 53 per cent. of clean wool. In this year the total quantity of raw wool available for consumption was 2249 million lbs. against 2129 million lbs. in 1904. This was 93 million lbs. less than in the record year 1895, but the estimated supply of clean wool was 1250 against 1257 million lbs. in 1895, owing to the increased proportion of cross-bred wools. The average price per lb. was the highest since 1889, and the total value probably greater than in any year since 1873. For the present season Messrs Helmuth Schwarze & Co., anticipate an additional supply from the Colonies and the River Plate of about 45 million lbs. of clean wool, which, considering the activity of the wool manufacture and the low stocks, will probably be absorbed without lowering prices. The supply per head of population in Europe and North America, 2·60 lbs. in 1905, will, if the forecast proves correct, rise to 2·67 lbs., which is still much less than in the years of large supplies, 1895-7.




The above quantities are of fleece-washed wool, yielding about 75 per cent. of clean wool. The number of sheep in the Uuited Kingdom in 1905 was rather more than 29 million, being a reduction compared to 1904, and far fewer than in 1892, when the number was over 33½ million.









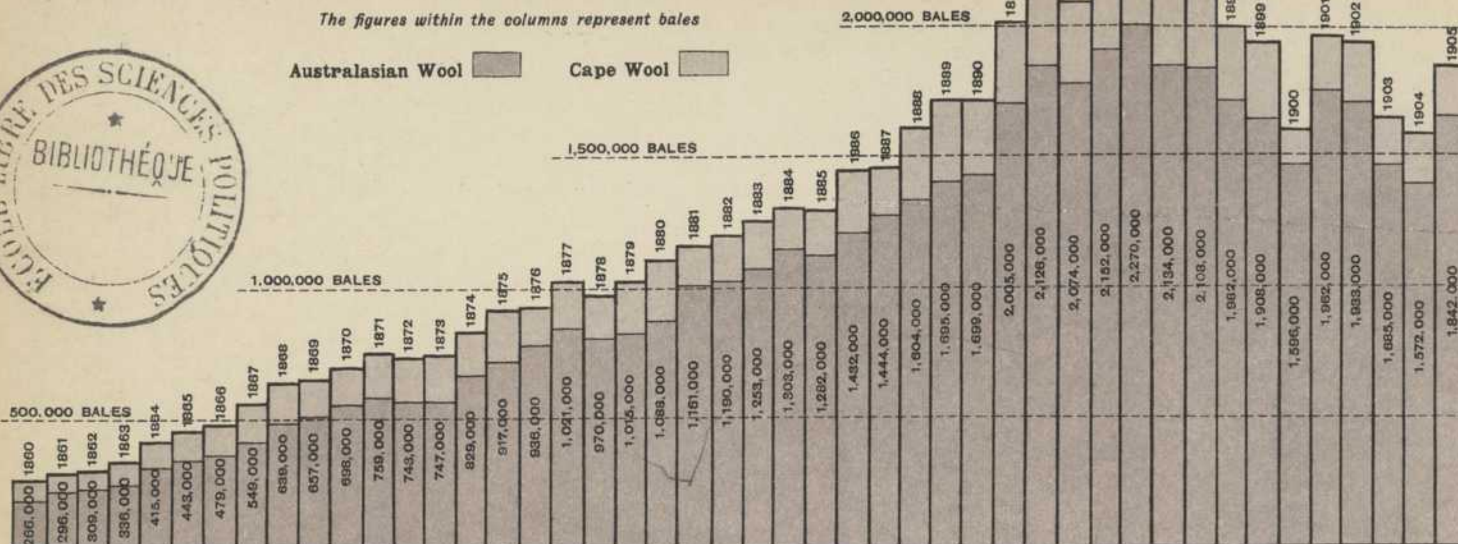



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## IMPORTS OF COLONIAL WOOL INTO EUROPE AND AMERICA SINCE 1860

*The figures within the columns represent bales*




The similarity of this diagram to the preceding one shows that the supply is mainly dependent on the Colonies. The number of sheep in Australia reached a maximum of 106.4 million in 1892, and fell to only 54 million in 1903. In 1905 it had risen 65.8, and is probably increasing considerably. A Colonial bale yields on an average about 180 lbs. of clean wool.

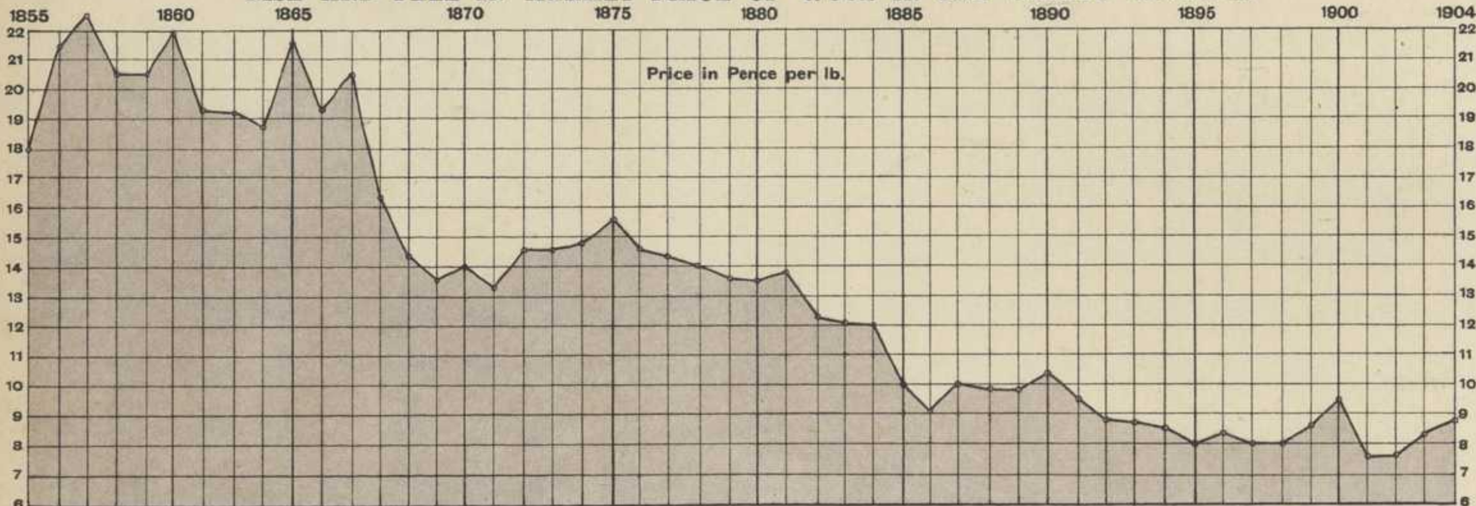
## SOURCES OF BRITISH SUPPLY OF WOOL (Average 1902-4)

Total, 599,000,000 lbs. £20,304,000 value

| AUSTRALIA | NEW ZEALAND | CAPE COLONY | BRITISH EAST INDIES | FRANCE | ARGENTINA | CHILE | TURKEY | NATAL | URUGUAY | BELGIUM | OTHER COUNTRIES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 237,700,000 lbs. or 39·7 % | 145,700,000 lbs. or 24·3 % | 64,400,000 lbs. or 10·7 % | 32,900,000 or 5·5 % | 21,300,000 lb. or 3·6 % | 20,700,000 lb. or 3·4 % | 15,700,000 lb. or 2·6 % | 10,000,000 lb. | 9,200,000 lbs. | 9,000,000 | 8,200,000 | 24,600,000 lb. or 4·1 % |

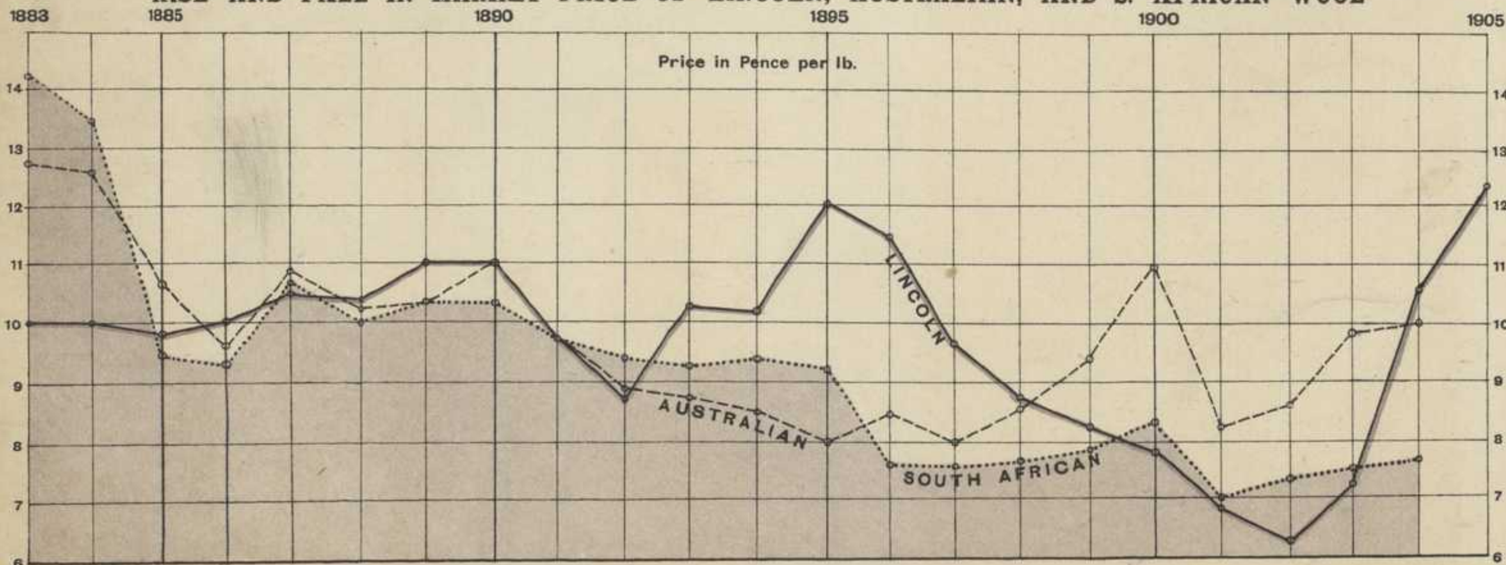
The above represents the imports of sheep and lambs' wool only. A large quantity is re-exported. The quantity left for home consumption is estimated for 1905 at 468 million lbs., alpaca and mohair included.

## RISE AND FALL IN MARKET PRICE OF WOOL IN THE UNITED KINGDOM




The above are the average prices of wool imported into the United Kingdom.

## RISE AND FALL IN MARKET PRICE OF LINCOLN, AUSTRALIAN, AND S. AFRICAN WOOL




The prices indicated are the average prices of Australian and South African wool. In 1905 the prices for Australian merino were about 5 per cent. higher than in 1904, and for fine cross-breds, 10 per cent. Cape wool rose about 5 per cent.

## FLAX.

**General Summary.**—The commercial fibre is obtained from *Linum usitatissimum*, of which two varieties, *vulgare* and *crepitans*, are most cultivated, other varieties yielding a coarser fibre. More than 90 per cent. of the flax of Europe is grown in Russia, and Austria, Belgium, and France are large producers. In many countries flax is grown chiefly or entirely for its seeds, as in North and South America. The plant flourishes best in deep soil rich in phosphates, but it is more affected by climate than soil. A sea climate, as in Ireland, Belgium, and on the Baltic coast seems to suit it. A moderate temperature is best when the plant is grown for its fibre, but where the seeds are the object of culture, as on the steppes of South Russia, a hot summer is by no means prejudicial. After the stems are gathered (pulled up by the roots), they are subjected to the processes of rippling to remove the seeds; of retting, whereby the resinous substance which cements the useful fibre to the woody matter is removed by fermentation; breaking and scutching, whereby the woody matter is removed. Involving so much labour, and being an exhausting crop to the soil, flax is not much more extensively cultivated, except in Russia, than formerly, the reduction of the acreage in Ireland being very large. See also LINEN in the List of Commodities.

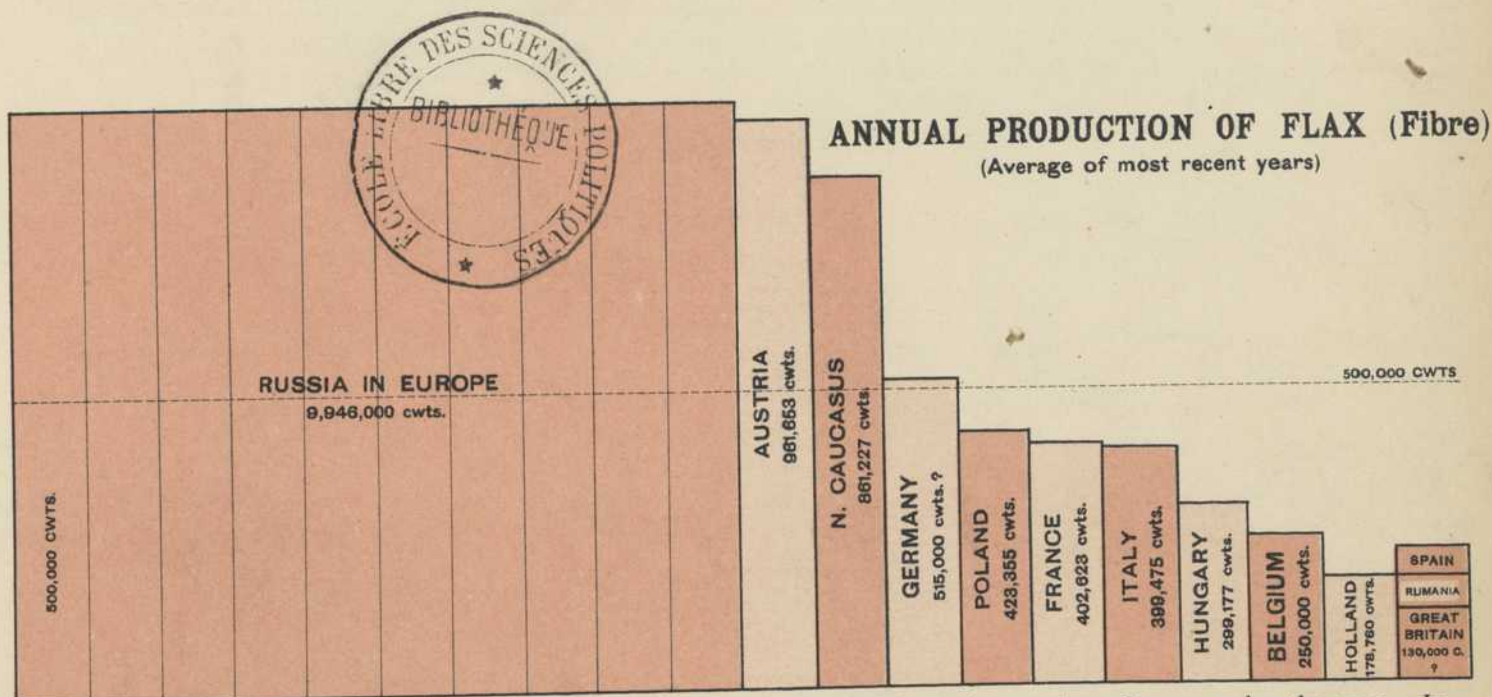
## HEMP.

**General Summary.**—Hemp is a strong fibre derived from *Cannabis sativa*, an annual plant. The plant requires a most warm climate, but, as its period of growth is only 90 to 105 days, it can be grown on the coasts of the Baltic as far north as 60°. The fibre is generally 3 to 7 feet long, and in Italian hemp, which is the best, somewhat longer. Hemp being stronger than flax, is used for such articles as sailcloth, ropes, packing sheets, etc. The seed is sold as food for tame birds, and yields an oil used as an illuminant, and in mixing paints and varnishes. Indian hemp, or bhang, is a variety much used in the East as an intoxicant, and administered in Europe as a sedative. See also MANILLA, MAURITIUS, SISAL, NEW ZEALAND, DECCAN and SUNN HEMP, in the List of Commodities.

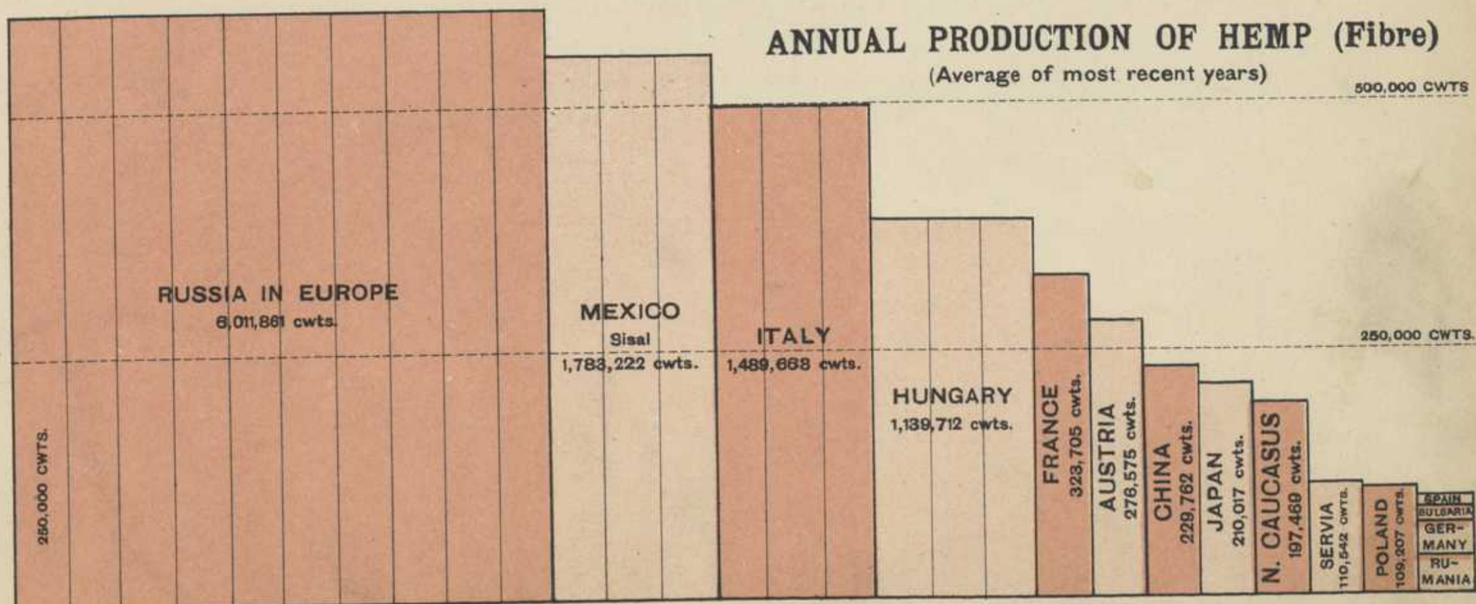
## JUTE.

**General Summary.**—The fibre obtained from the inner bark of *Corchorus capsularis* and *C. olitorius*, annual plants allied to the lime, which are cultivated in the east, but on a large scale only in Bengal. The soft, strong, and bright coloured kinds are best for textiles. Long fibre of a bad colour is woven into gunny bags. Jute is also made into hessian, carpets, tarpaulins, and backing for floor-cloths, and, taking a fine gloss, is frequently added to silk. It is also mixed with flax and hemp. The chief seat of the jute industry in Europe is Dundee, but the manufacture is also carried on in several continental countries, and the United States. Near Calcutta, mills are working up more and more of the material, and European manufacturers may soon find it difficult to obtain supplies. Sisal hemp may, however, take its place.






The production in Germany and Belgium can only be estimated from the number of acres under the crop. In Great Britain (chiefly Ireland) also, the production is not returned and the quantity given is deduced from the acreage and the yield in former years. During the past 25 years the acreage has decreased by more than half.




Like flax, hemp is a rather stationary crop. In Russia proper there has been an increase of acreage compensated by a decrease in Poland.

EXPLANATION OF COLOURING

Flax | Hemp | Jute & Ramie

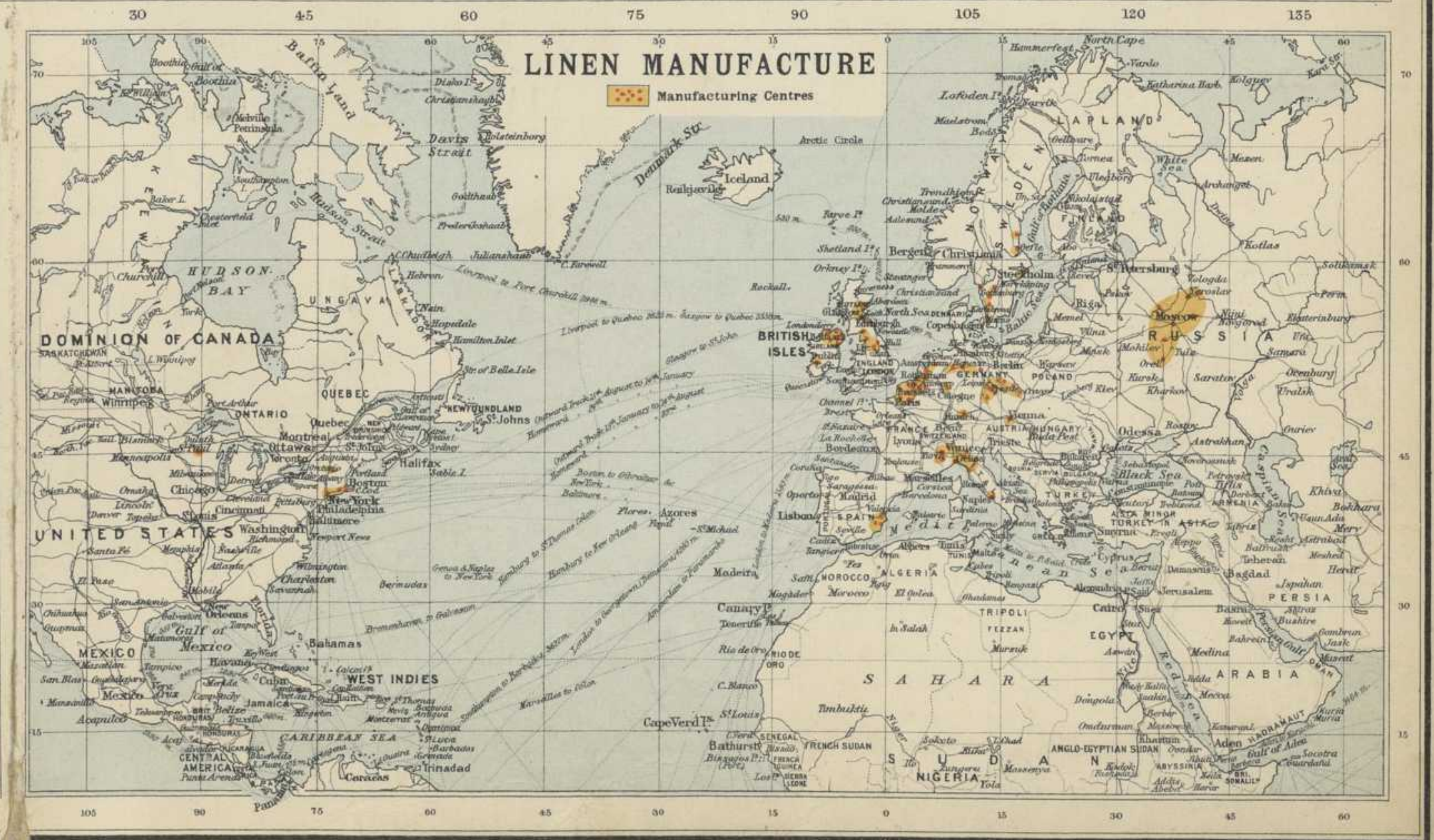
Other Fibres indicated by name

Lines of Export



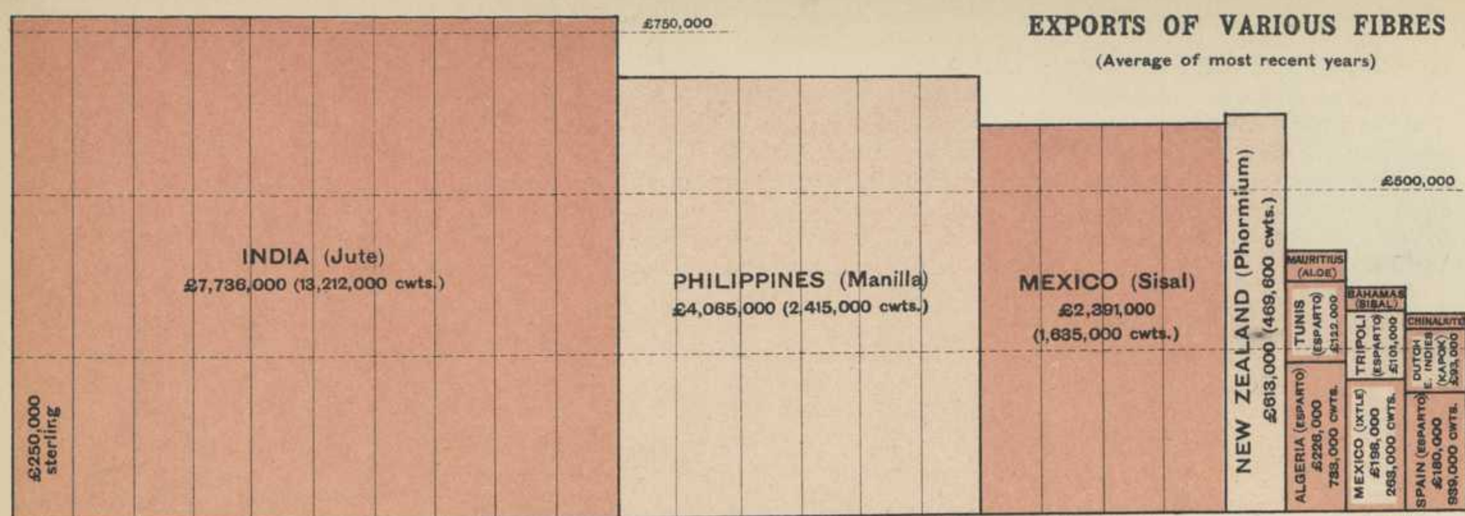




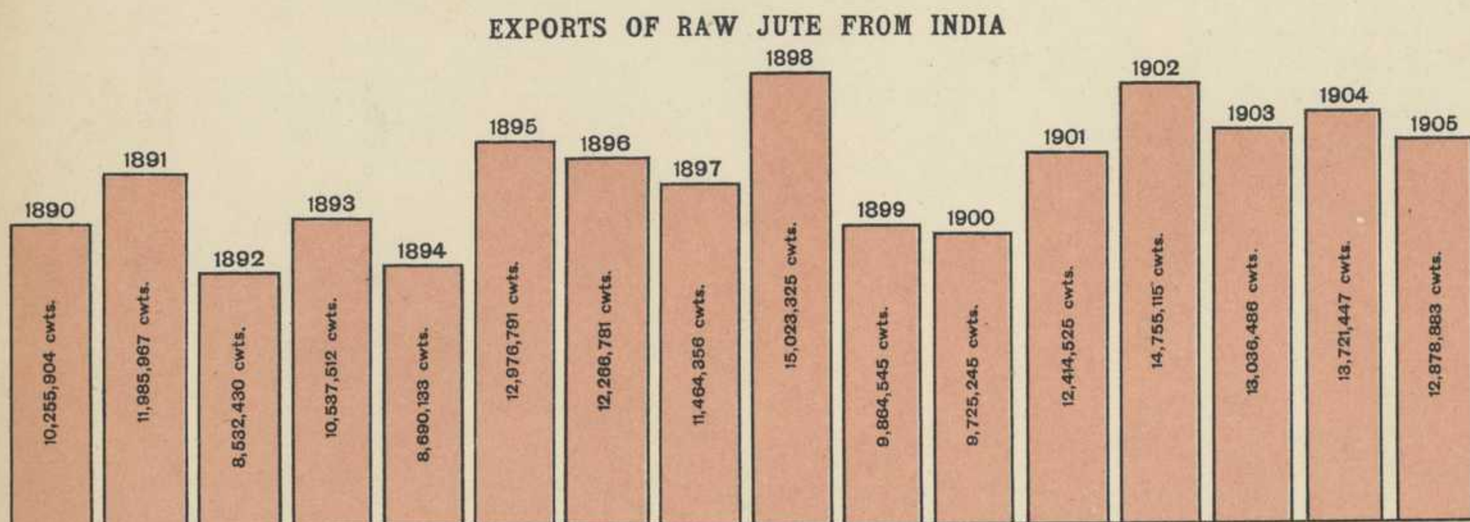
## EXPORTS OF VARIOUS FIBRES

(Average of most recent years)




The exports of most of these fibres is increasing. Much larger quantities of Manilla hemp are exported, New Zealand sends out more Phormium, and the cultivation of Sisal hemp is being extended. The exports of jute from China, still small, have much increased and may become of importance considering the growing scarcity.

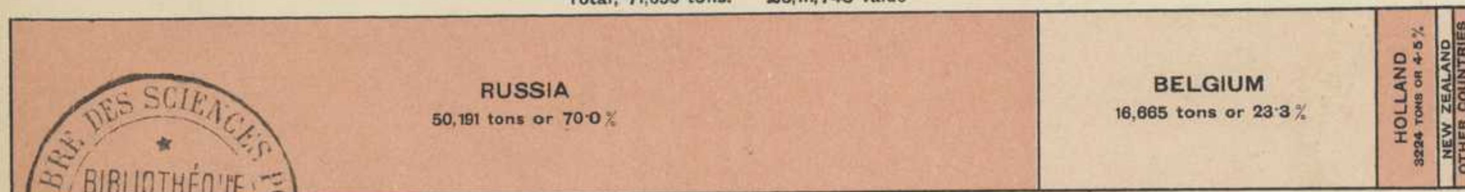
## EXPORTS OF RAW JUTE FROM INDIA




It will be noticed that there is a decided fall in the last three years, a fall likely to continue owing to the growing manufacture in India. The exports of jute manufactures from India are of twice the value they were ten years ago.

## SOURCES OF BRITISH SUPPLY OF FLAX (Average 1902-5)

Total, 71,659 tons. £3,111,743 value





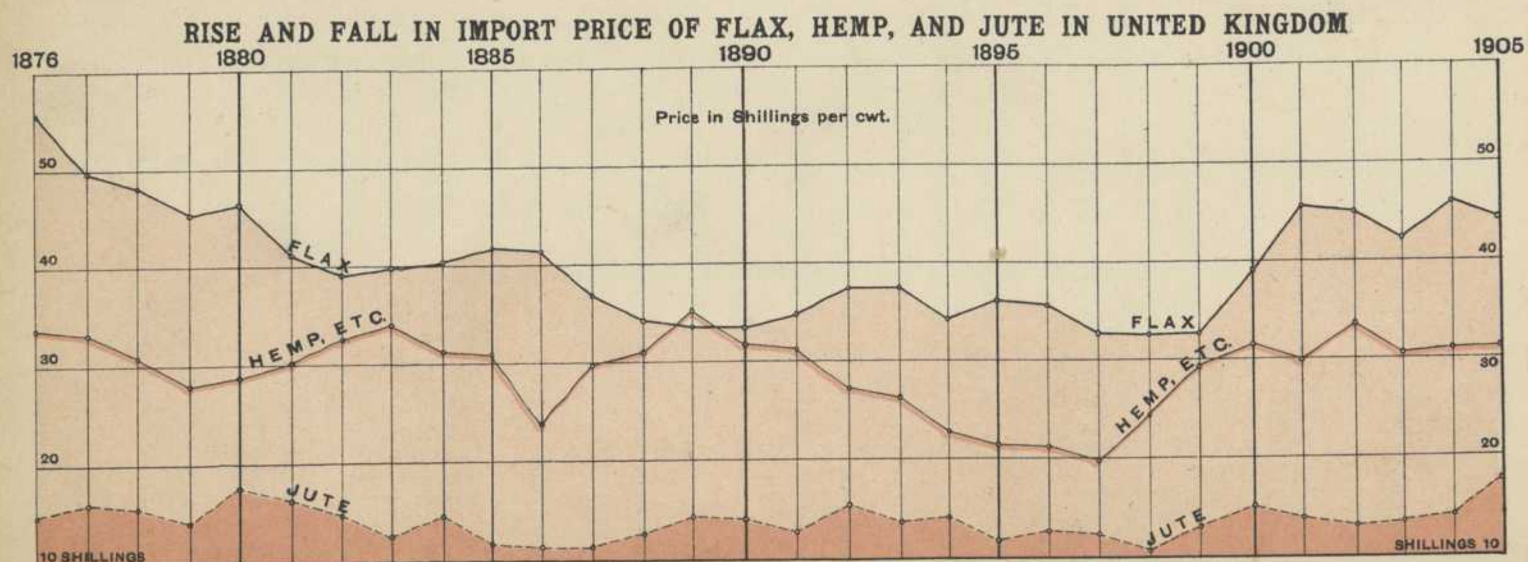

## SOURCES OF BRITISH SUPPLY OF HEMP, Etc. (Average 1903-5)

Total, 117.635 tons. £3,706,541 value




The imports from Russia have increased, and from Germany decreased. Of New Zealand hemp (Phormium) only 6,828 tons were imported in 1901, and 22,654 in 1905.

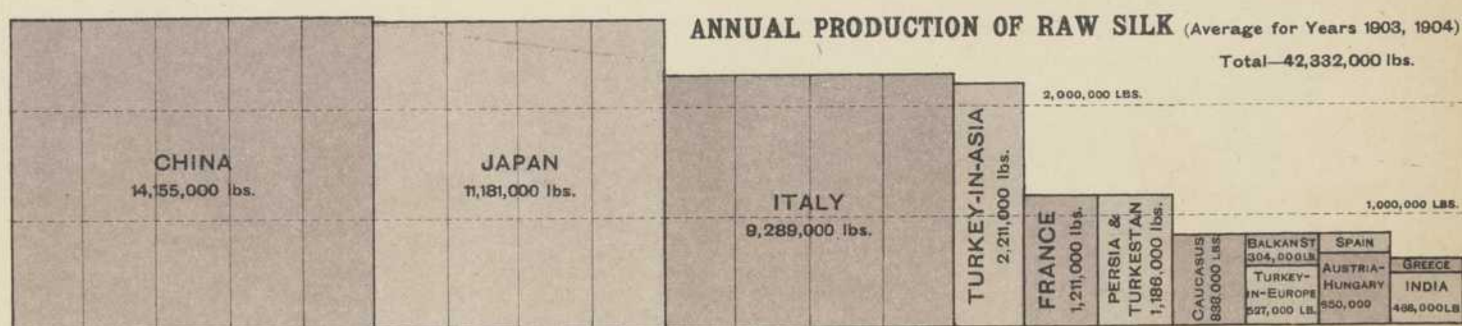
## RISE AND FALL IN IMPORT PRICE OF FLAX, HEMP, AND JUTE IN UNITED KINGDOM



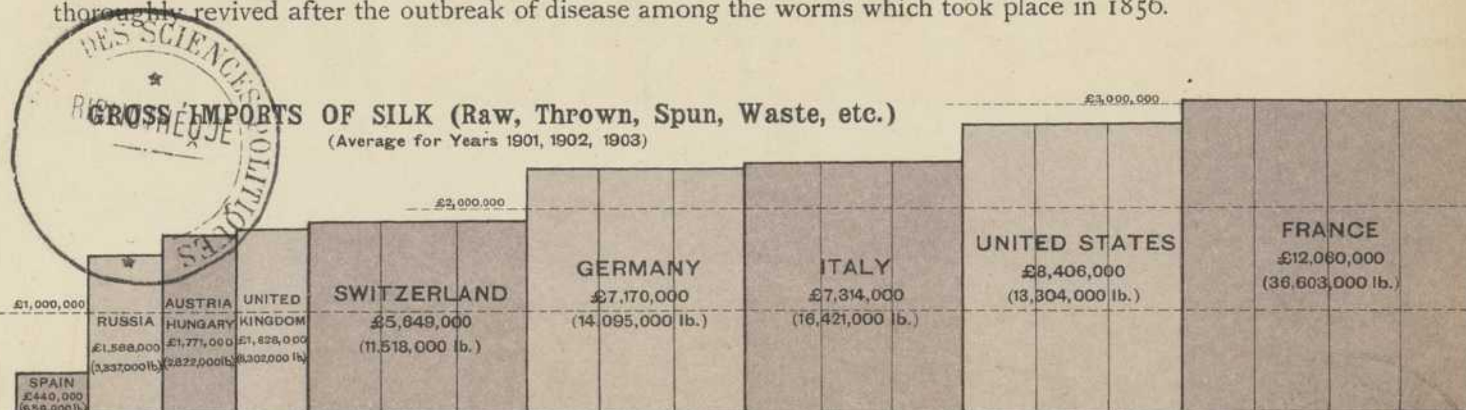

There is a marked rise of late years in the price of flax, and this year the price has been high. Some disturbance has been caused in the market by the unsettled conditions in Russia. The high price of jute is due to the reduced exports from India. It has continued to rise in 1906.

# SILK.

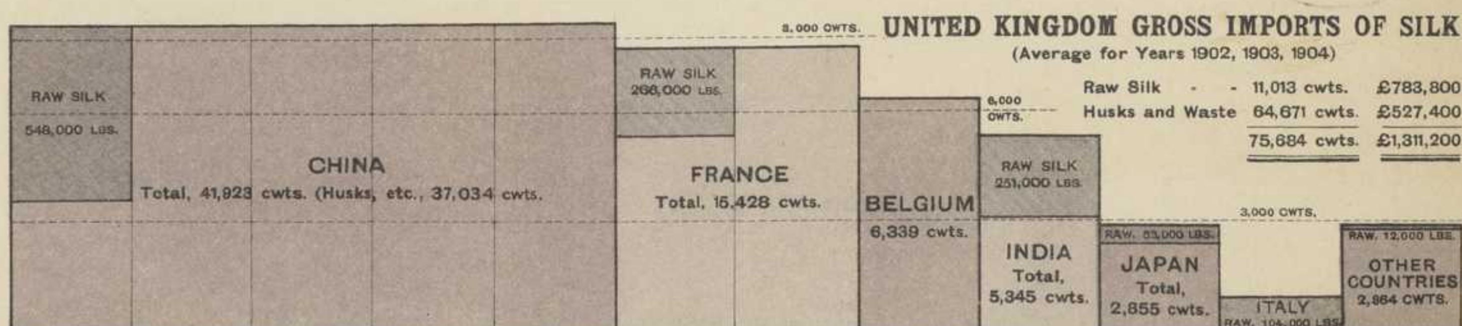
**General Summary.**—Silk is the fibre of the cocoon formed by the silk-worm, of which there are many varieties. The most important is the *Bombyx mori* reared in China, Bengal, Japan, France, and Italy. *Bombyx tector*, of South China and Bengal, also produces a good cocoon of a pale colour, and there are many other varieties found in Burma, the Himalayas, and other parts of India. Besides these, all of which feed on the mulberry, there are numerous other kinds of the *Saturniidæ* family which produce what is called wild silk, though many of them are more or less domesticated. Chief among them are the *Antheræa yamamai* of Japan, the ailanthus silk-worm of China (*Attacus cynthia*) and the *Antheræa mylitta* which is found all over India and yields tasar (tussore) silk. These wild silks are as a rule coarser than those of the mulberry silk-worms, and, except the tasar and Japanese silks, barely as strong. The cocoons are placed in warm water to soften the gum which coats the silk, and the threads of four to six cocoons are wound off together. This constitutes raw silk which is now used for the warp of some cheaper kinds of silk materials. The quantity yielded by the cocoons varies with the variety and the care with which the silk-worms are reared; in Italy it ranges from 10 to 16 per cent. of the weight. The flossy outside covering and the innermost part, known as husks and knubs, together with the short threads broken off in reeling and subsequent operations, are sold as silk waste. Raw silk is thrown, that is, a slight twist is given to it which enables it to adhere to other fibres, is wound, cleaned, and doubled to form organzine, which is used for the warp of fabrics, while tram, which is used for the woof, is composed of threads not previously twisted. The chief centres where this industry is carried on are Milan and Turin, Lyons and St Etienne, Zurich and Basle, Crefeld and Elberfeld, but Milan is the most important. In 1904 more than 20 million lbs. of silk were "conditioned," that is, tested as to weight, condition, etc., in Milan, while at Lyons, the centre next in importance, the quantity was between 14 and 15 million lbs. Artificial silk is made from various forms of cellulose, usually wood-pulp. A collodion is made, and forced through fine capillary jets, and the silk is denitrated by some reagent. This silk is weaker and less elastic than natural silk but is much cheaper. It is manufactured in France, Germany, Switzerland, England, and the United States.



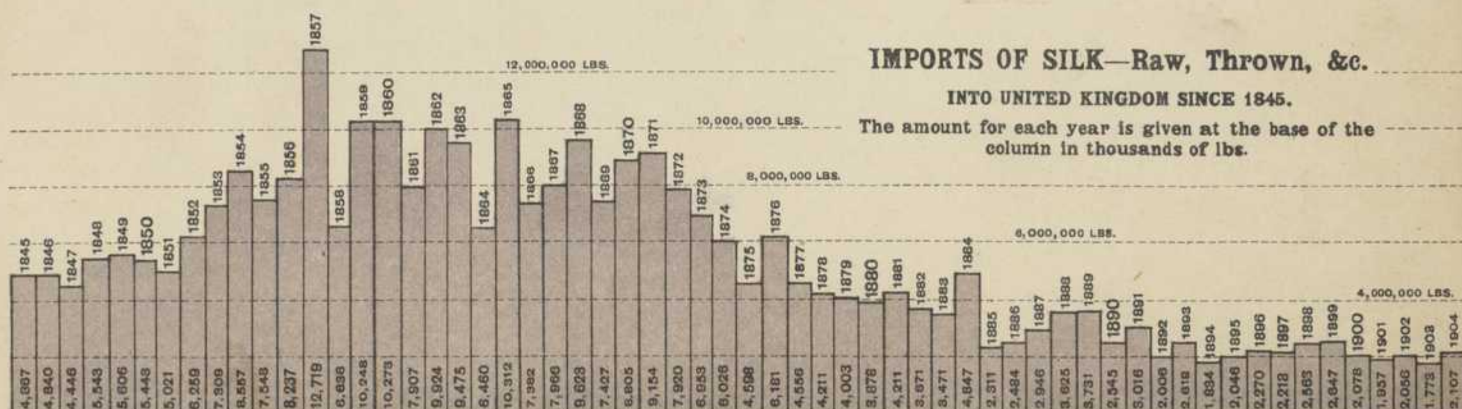

The production has steadily increased without any very sudden leaps. The average for the years 1891–95 was 33,710,000 lbs., for 1896–1902, 37,580,000 lbs. In Western Europe the production was small in 1903, but rose in 1904 to over 13 million lbs. Fifty years ago France produced more raw silk than Italy, but the industry has never thoroughly revived after the outbreak of disease among the worms which took place in 1856.



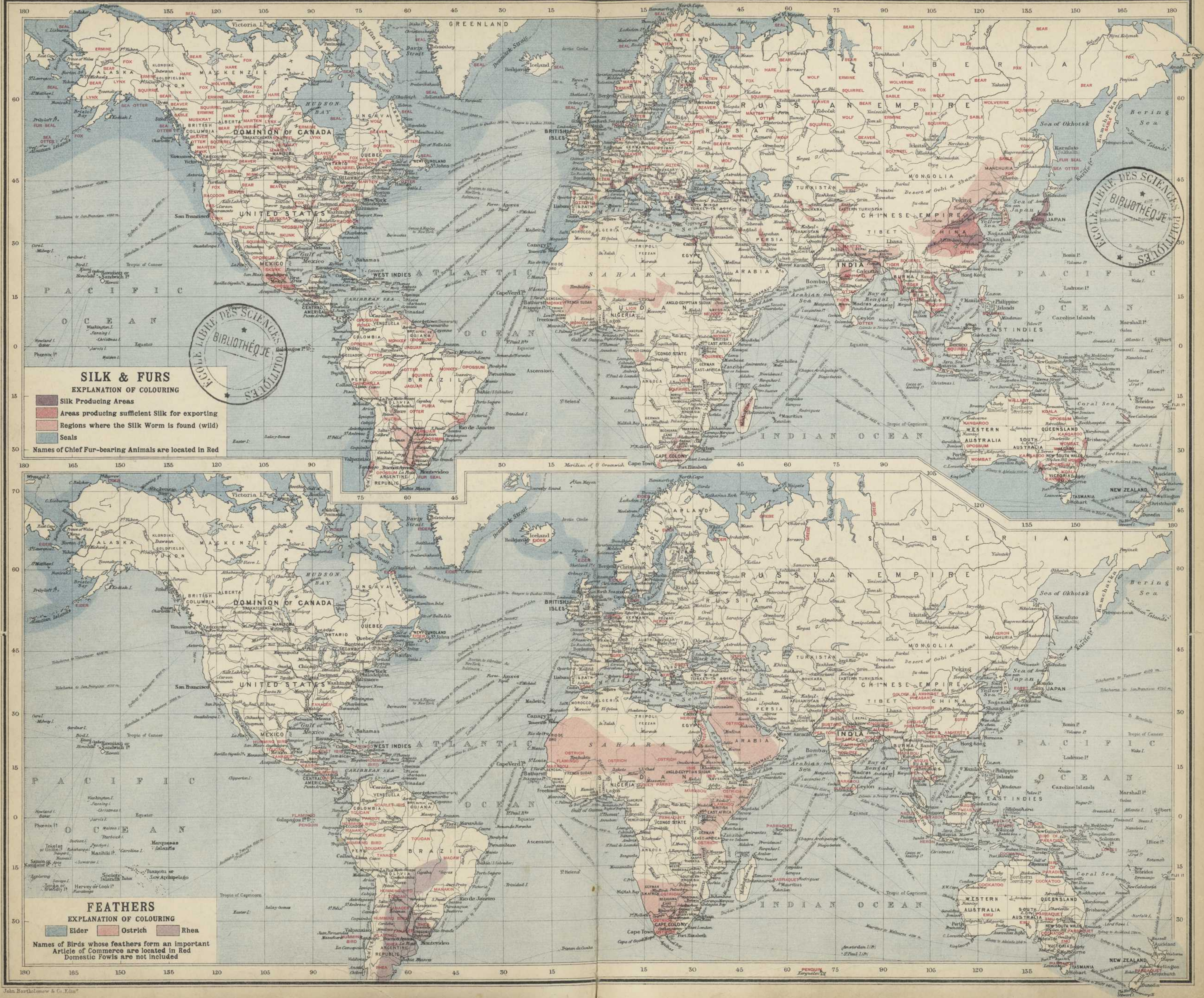

The gross imports are here shown of silk in various stages of preparation for the manufacture of fabrics. The values vary with the proportions of the various kinds imported. Italy imports a large quantity of cocoons, France exports a large quantity of its imports, but also retains a considerable proportion for its flourishing manufactures. In the United Kingdom the average value is lowered by the large imports of waste silk.




Silk waste, which fifty years ago was almost worthless, has become since the invention of the late Lord Masham an important raw material and is worked in France, Alsace, and Switzerland, as well as in Great Britain.



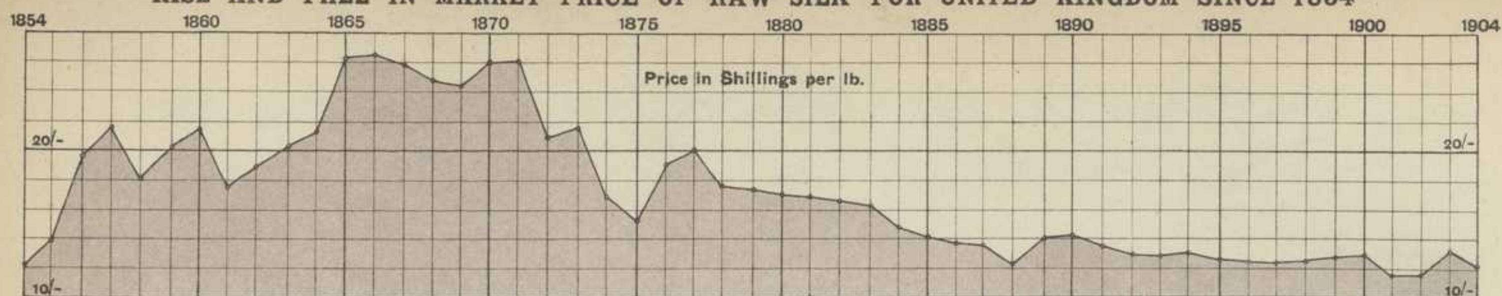

The imports show a very large falling off, though the price of raw silk has been much reduced in the past thirty years. Under a treaty with France in 1860 silks were introduced free of duty, and British manufacturers have been unable to compete with those of France.






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### RISE AND FALL IN MARKET PRICE OF RAW SILK FOR UNITED KINGDOM SINCE 1854




# FURS AND FEATHERS.

**General Summary.**—The greater part of the most valuable furs are obtained in the northern hemisphere, especially Siberia, Canada, and Alaska. Some seal-skins, nutria and chinchilla, come from South America. Africa supplies monkey skins, and Australia sends kangaroo, wallaby and opossum skins, and rabbit skins in large quantities. The names of the chief fur-bearing animals are marked on the map, and details are given under those names in the List of Commodities. The chief continental markets for furs are held at Nijni-Novgorod, and Leipzig, and London is the most important centre for their preparation. Furs have been more fashionable of late years, but, though prices have risen, the supply has been fairly maintained except in the case of the sea-otter, the guereza monkey, the beaver from some parts, and fur-seals. Feathers are a product of all parts of the world. Useful feathers—for beds, pillows, etc.—are plucked from domestic fowls and other birds in all civilized countries, and a large quantity of eider-down, goose, swan, and sea-bird feathers are obtained on the northern coasts of both hemispheres. Ornamental feathers come also from tropical and sub-tropical countries where the birds have generally a brighter plumage. For these, as for the furs, the map and the List of Commodities may be consulted.

### SOURCES OF BRITISH SUPPLY OF FURS—SEAL-SKINS (Average 1902-4)

| | |
|---|---|
| NEWFOUNDLAND | 139,135 skins or 35·7 % |
| NORWAY | 80,388 skins or 20·6 % |
| CANADA | 34,474 skins or 8·8 % |
| RUSSIA | 31,938 skins or 8·2 % |
| UNITED STATES | 31,016 skins or 8 % |
| FRANCE | 17,387 or 4·5 % |
| CHILE | 12,382 sks. or 3·2 % |
| CAPE OF GOOD HOPE | 11,189 sks. or 2·9 % |
| JAPAN | 11,148 sks. or 2·8 % |
| URUGUAY | 7,022 or 1·8 % |
| FALKLAND I. | 5,205 or 1·3 % |
| OTHER COUNTRIES | 8,808 sks. or 2·2 % |

Total, 390,092 skins; value, £397,493. A great part of these skins are made into leather. Besides the fur-seal skins, some others, as the "wool-seals," that is, very young hooded-seals, are dyed and used as trimming, etc. See also SEALS in the List of Commodities.

### SOURCES OF BRITISH SUPPLY OF FURS—RABBIT SKINS (Average 1902-4)

| | |
|---|---|
| AUSTRALIA | 25,897,649 skins or 54 % |
| FRANCE | 8,445,663 skins or 17·6 % |
| BELGIUM | 7,193,813 skins or 15 % |
| NEW ZEALAND | 5,205,276 SKINS OR 10·8 % |
| OTHERS | 1,220,042 SKINS |



Total, 47,962,443 skins; value, £410,759.

### SOURCES OF BRITISH SUPPLY OF FURS—unenumerated (Average 1902-4)

| | |
|---|---|
| UNITED STATES | 4,856,136 skins or 32 % |
| AUSTRALIA | 4,431,404 skins or 29·3 % |
| CANADA | 1,477,378 skins or 9·8 % |
| GERMANY | 1,341,121 SKINS OR 9% |
| CHINA | 1,147,405 SKS OR 7·5% |
| RUSSIA | 867,597 SKINS OR 5·7% |
| HOLLAND | 379,105 SKS., 2·5% |
| OTHER COUNTRIES | 650,888 SKINS OR 4% |

Total, 15,151,034; value, £1,657,818. These include all the innumerable kinds of furs used for dress, rugs, etc.—sable, ermine, fox, mink, racoon, nutria, and otter, opossum, monkey, beaver, and many others.

### SOURCES OF BRITISH SUPPLY OF FEATHERS AND DOWN FOR BEDS (Average 1902-4)

| | |
|---|---|
| FRANCE | 7,755 cwts. or 23·1 % |
| CHINA | 6,507 cwts. or 19·4 % |
| GERMANY | 6,324 cwts. or 18·9 % |
| HONG-KONG | 5,912 cwts. or 17·6 % |
| UNITED STATES | 2,696 c. OR 8% |
| JAPAN | 2,259 CWTS. OR 6·8% |
| HOLLAND | 533 C. OR 1·8% |
| OTHER COUNTRIES | 1,533 CWTS. OR 4·6% |

Total, 33,519 cwts.; value, £98,048.

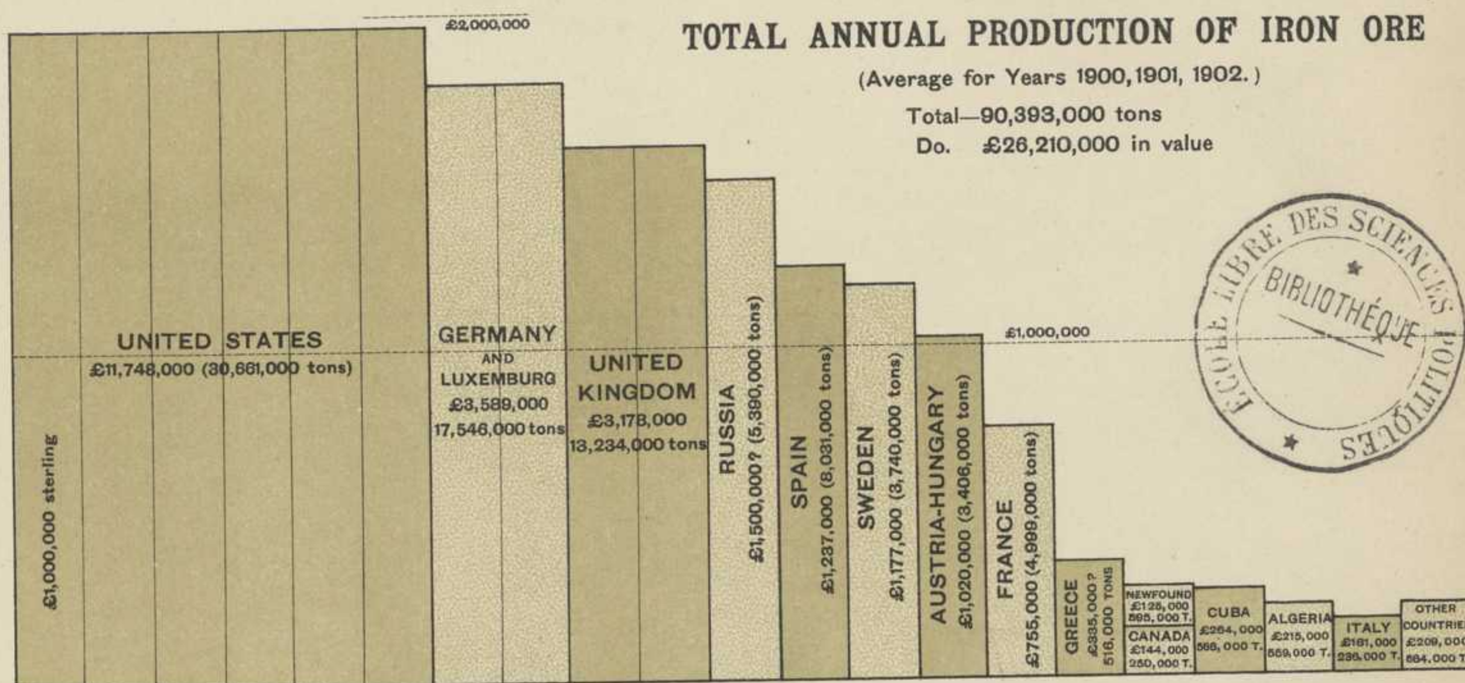
### SOURCES OF BRITISH SUPPLY OF ORNAMENTAL FEATHERS (Average 1902-4)

| | |
|---|---|
| CAPE COLONY | 453,224 lbs. or 37·3 % |
| FRANCE | 380,396 lbs. or 31·3 % |
| HOLLAND | 228,285 lbs. or 18·8 % |
| UNITED STATES | 35,934 LBS. OR 3% |
| GERMANY | 33,531 LBS. OR 2·7% |
| BRITISH EAST INDIES | 26,417 LBS. OR 2·2% |
| EGYPT | 14,234 LB. OR 1·2% |
| OTHER COUNTRIES | 43,108 LBS. OR 3·5% |

Total, 1,215,128 lbs.; value, £1,531,939. Cape Colony exports a large quantity of ostrich feathers. See OSTRICH FEATHERS in the List of Commodities. France and Holland obtain supplies from their foreign possessions or other countries, but they produce large quantities themselves, chiefly black and white feathers.

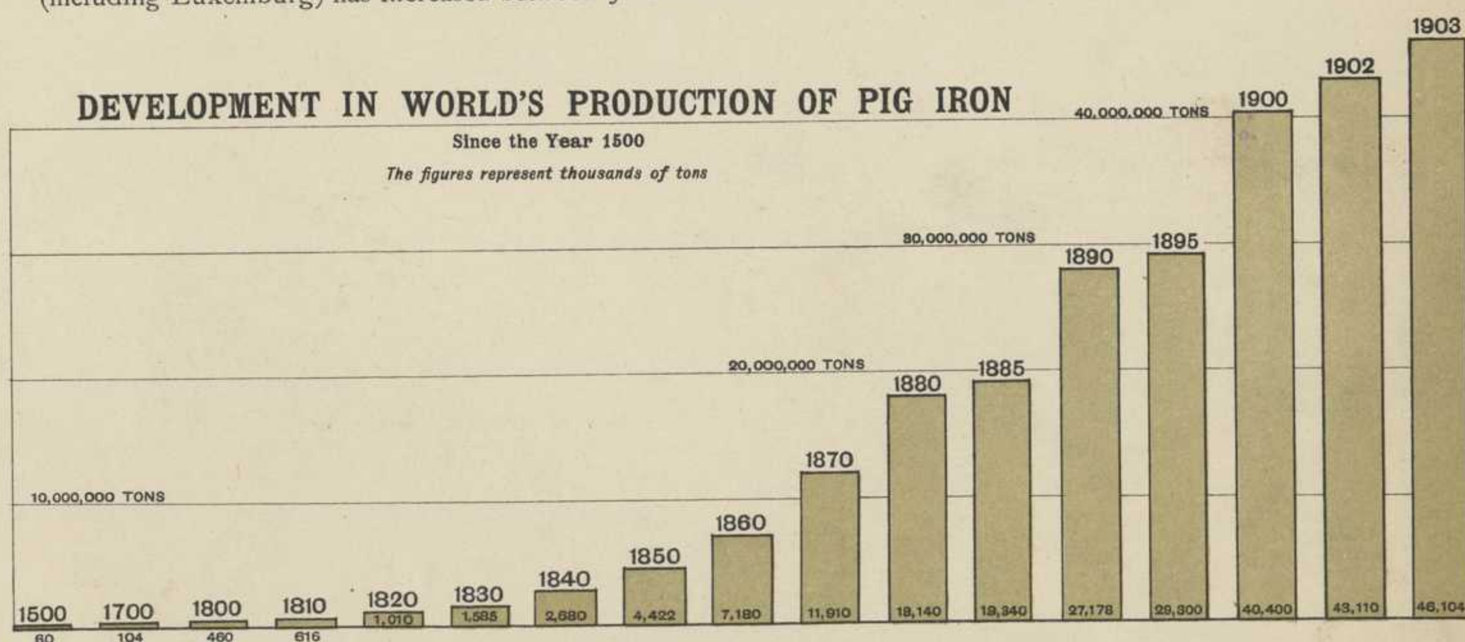
# IRON

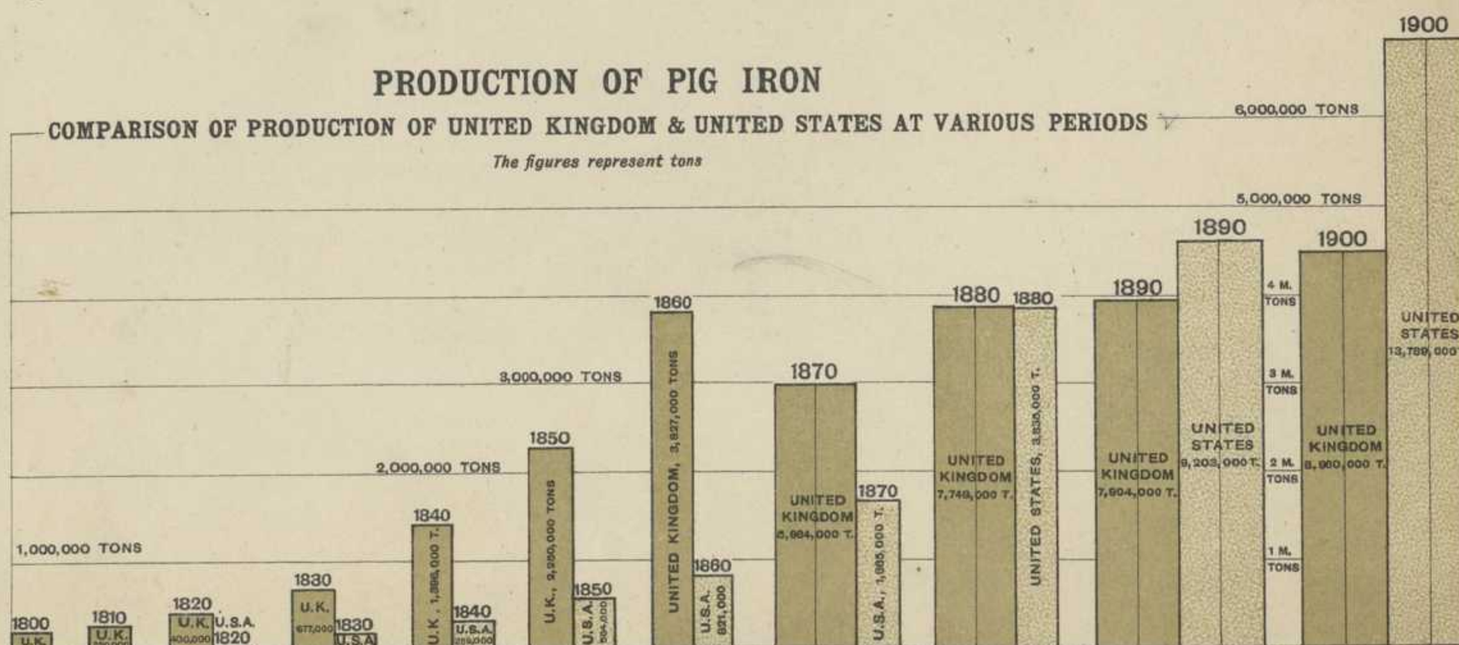
**General Summary.**—Iron is one of the most widely distributed and most useful metals. It is exceedingly rare in a native state, being found in large masses only in the basalts of Disko Island, Greenland, and in meteorites. The commoner ores are the sulphide or magnetic pyrites; the disulphide or iron pyrites; arsenical pyrites; hematite or red oxide; magnetite; limonite or brown oxide; and carbonate or spathic iron. Ore is mined in almost all European countries; in India and Japan, in Australia, North America, and Chile. In Africa it is common in small quantities, and is frequently smelted by the natives. Algeria exports a little. The chief producing countries are the United States, Great Britain and Spain. The ore contains 30 to 60 per cent. of pure iron, among the best being the ores of Canada, Sweden, Lake Superior and Algeria, and accordingly varies considerably in value. The United States now produces the largest quantity. Pig-iron is the rough metal extracted from the ore by fusion. It contains 2 to 5 per cent. of carbon, some silicon, and often sulphur, phosphorus, &c. It is easily cast, but is not malleable There are several grades of pig-iron, gray, mottled or white in colour, the last being crystalline and very hard owing to the combination of the carbon with the iron. Until 1889, Great Britain was the largest producer of pig-iron, but in that year, was outstripped by the United States, which has since then rapidly increased its output. Germany produces as much as Great Britain.






The growth of production in the United States is very remarkable. In 1870, the first year for which complete statistics exist, little more than 3 million tons were extracted. During the same period the output of Germany (including Luxemburg) has increased between 5 and 6 fold.



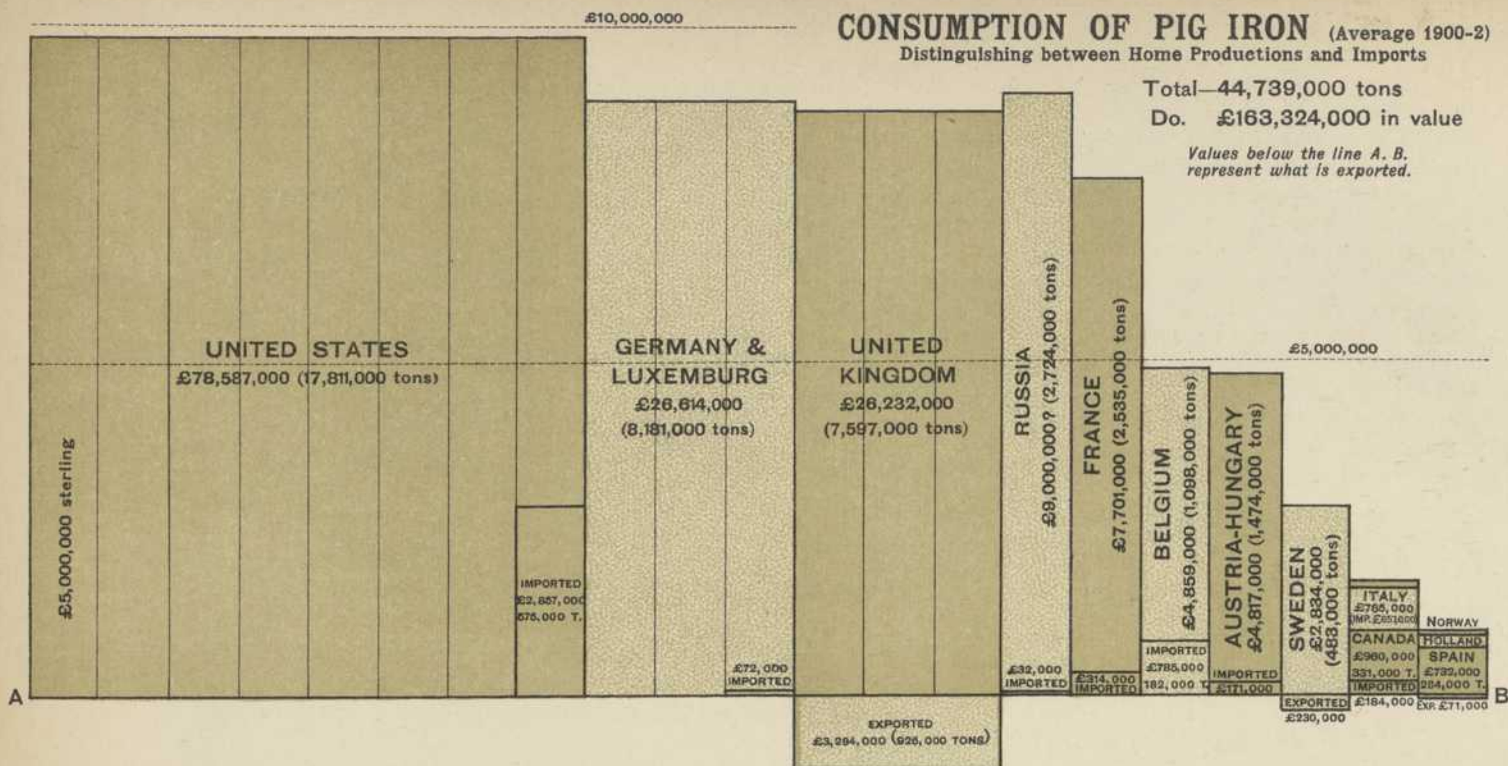

The output of the United Kingdom has not varied very greatly during the last 25 years. After attaining a maximum of 9,421,000 tons in 1899 it fell in 1900 and 1901, but rose again, and in 1905 was 9,593,000 tons, the absolute maximum. In the United States the production continues to rise rapidly, more than 18 million tons having been made in 1903.





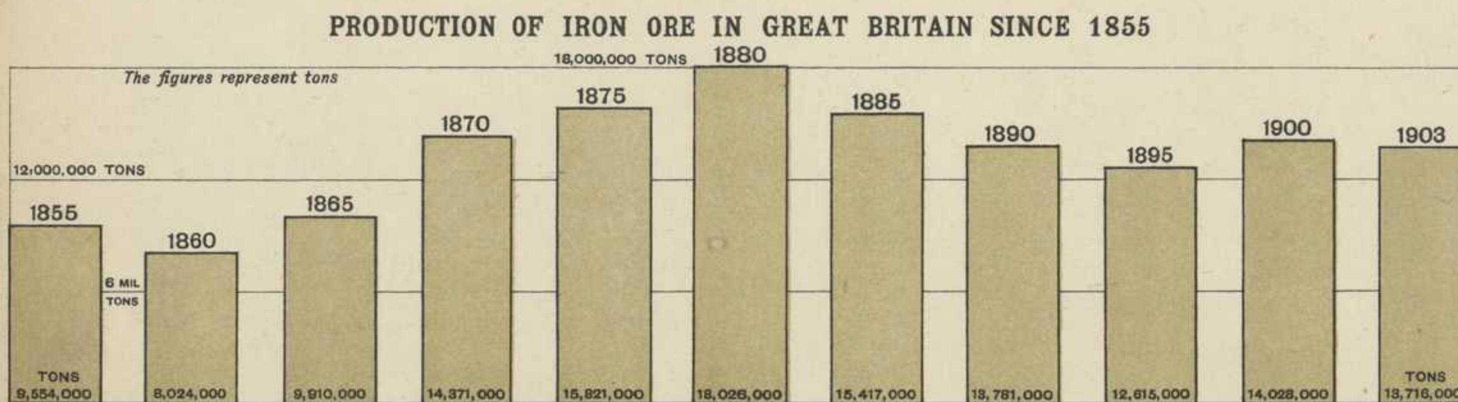


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The paralellograms *above* the line A B represent the consumption, and the figures beneath the names of countries refer to the consumption. To find the production, the quantities and values of the imports must be subtracted and those of exports added. According to the diagram the production of the United Kingdom exceeds that of Germany, but in the following year, 1903, Germany manufactured fully 9,912,000, or about 1,100,000 more than the United Kingdom.

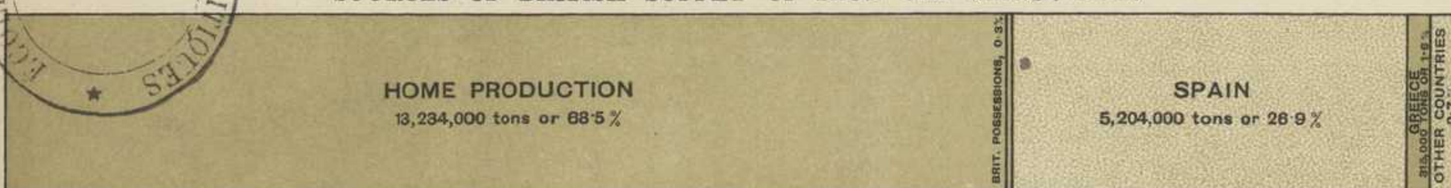
## PRODUCTION OF IRON ORE IN GREAT BRITAIN SINCE 1855



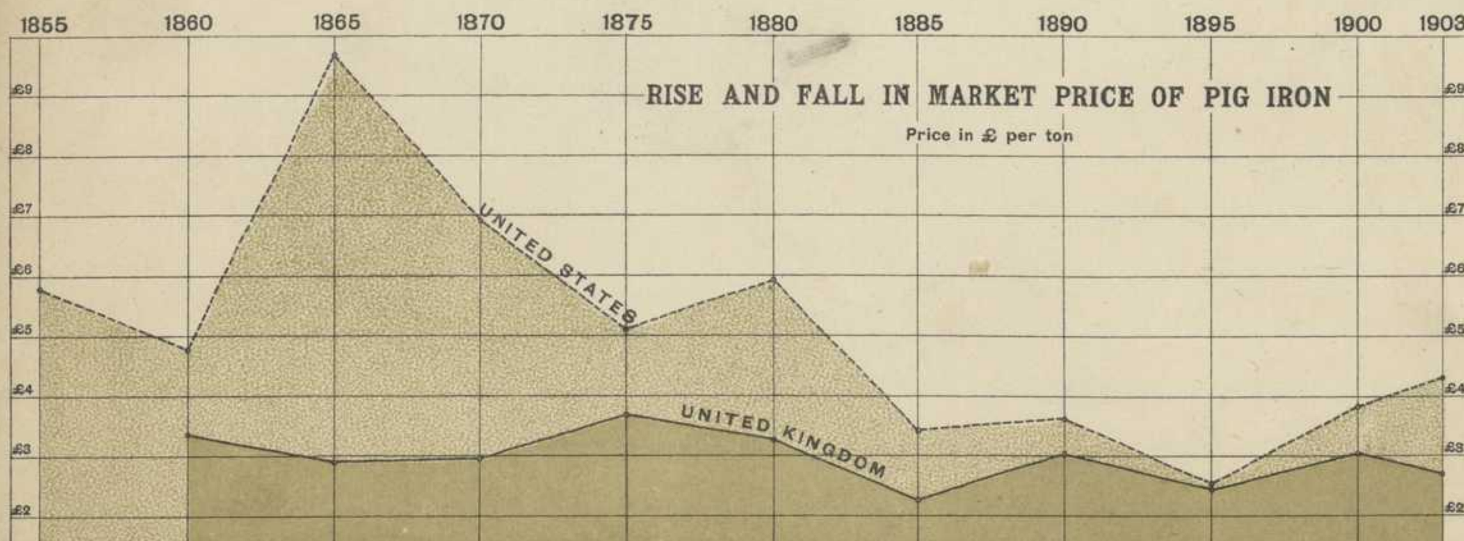

The maximum output was 18,032,000 tons in 1882.




## SOURCES OF BRITISH SUPPLY OF IRON ORE (Average, 1900-2)



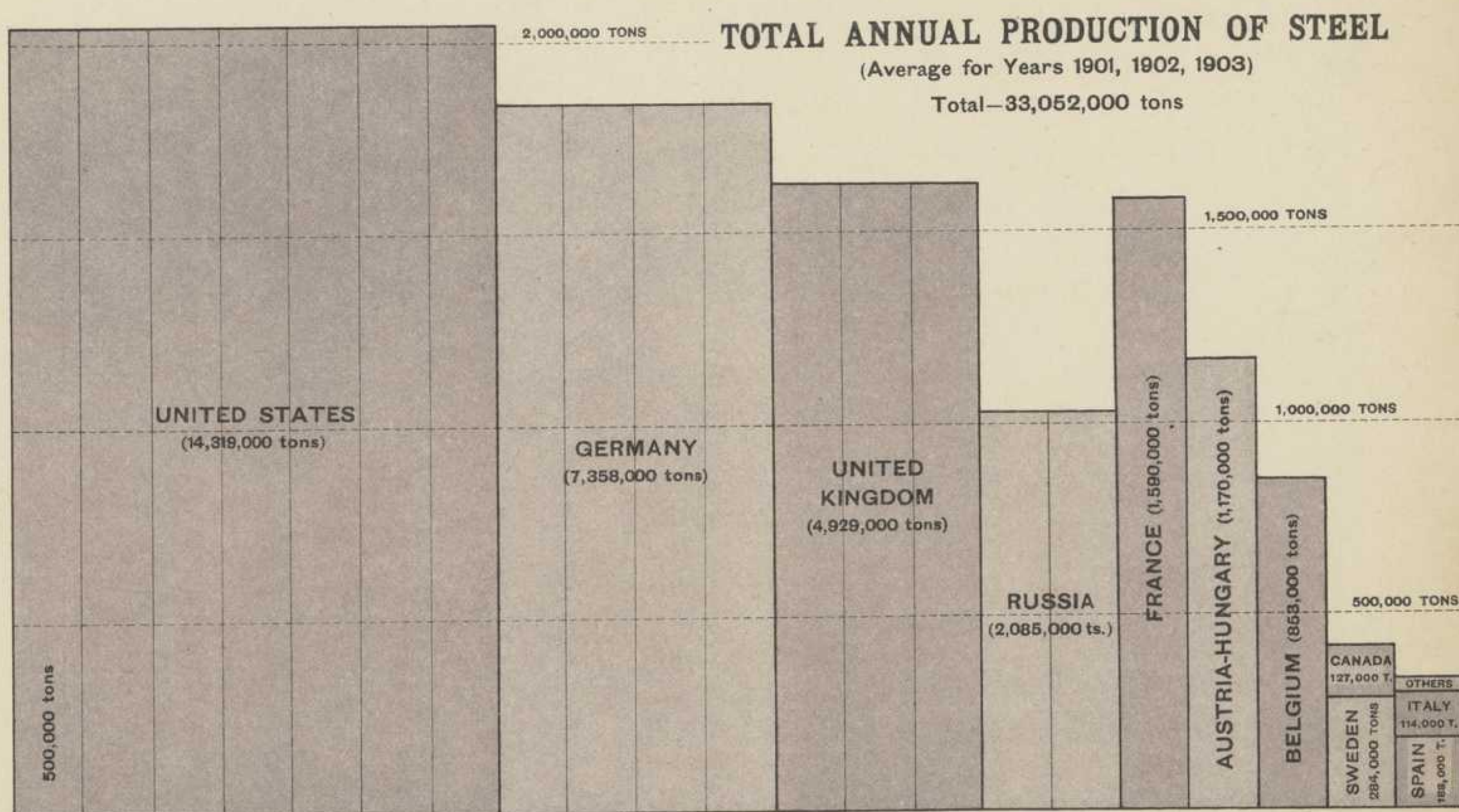

The import of iron ore has increased in a large ratio during the past 20 years, and now the imports amount to nearly half as much as the home production.




The price in the United Kingdom has not been subject to great fluctuations. In the United States, which is a newer manufacturing country, the tendency has been downward on the whole. The high prices about 1865 are, of course, the result of the Civil War.

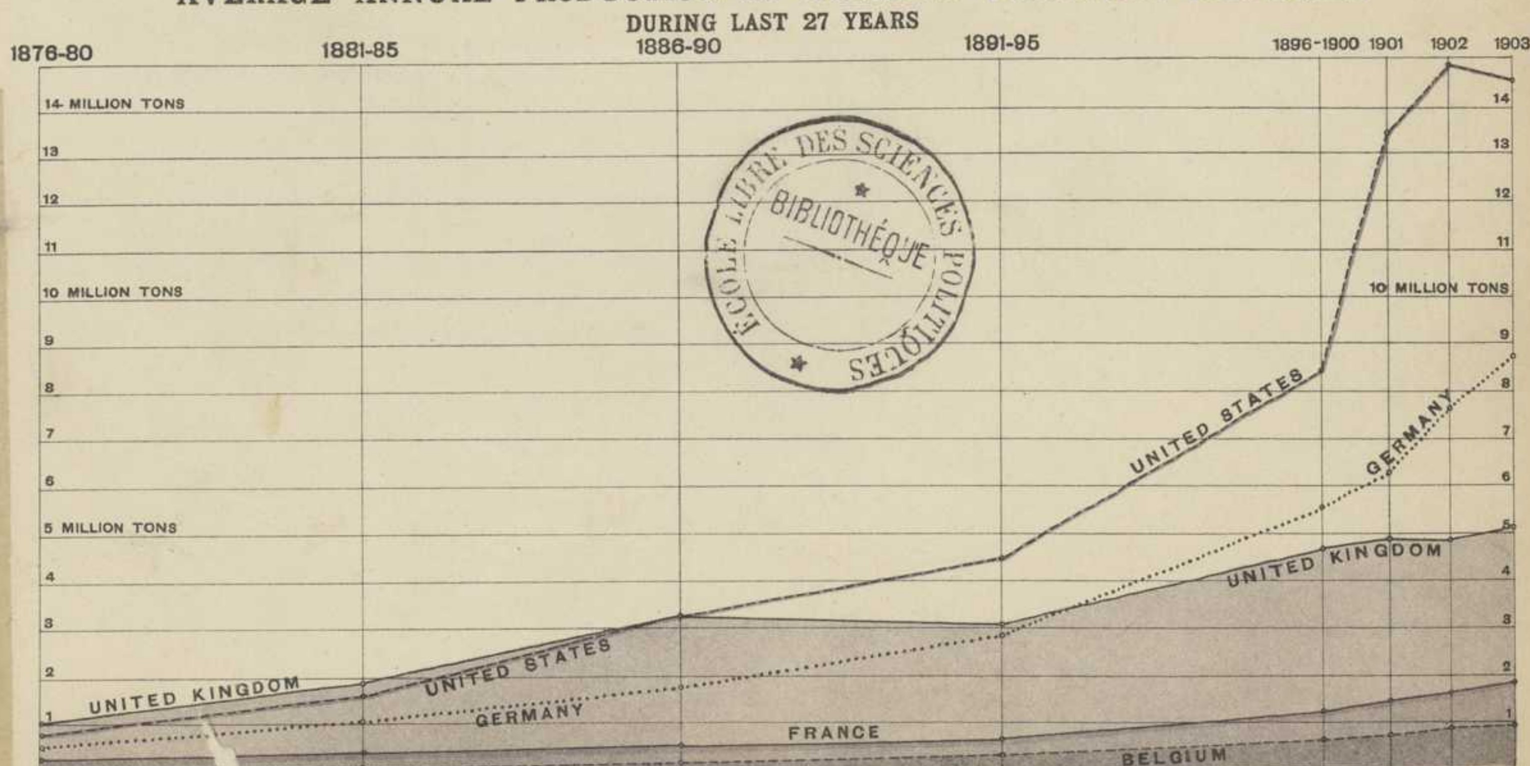
# STEEL.

**General Summary.**—Steel is iron purified and hardened by combination with carbon. The old process is by heating bars of iron with a quantity of carbon in sealed troughs by which they become rough and porous and are known as blister steel. They are then hammered, rolled, and melted in crucibles to distribute the carbon equally and remove all the slag. The finest and hardest steel is thus produced, but, being very costly, its use is limited. Cast steel is made on a large scale by the Bessemer process in which the iron is melted in a converter lined with gannister, a kind of sand-stone, and air is blown through it. The carbon is nearly all consumed, and the necessary amount is restored by adding a certain quantity of spiegeleisen or ferro-manganese. The Siemens-Martin, or open-hearth process, is conducted in a different kind of furnace and the air plays over the molten metal instead of being forced through it. Certain ores only, such as the hematite of Cumberland and Lancashire, are adapted for this purpose, for phosphorus, when present, is not removed, and the steel manufactured is too brittle for many purposes. By mixing the lining of the converter with lime, or adding lime to the contents, a base is provided with which the phosphorus can unite, and this is called the "basic" process, while the "acid" process is that with the siliceous lining. In the United Kingdom about twice as much open-hearth steel is manufactured as Bessemer steel, whereas in Germany and the United States, only about a third of open-hearth steel is produced, the ores in those countries being not well suited for the latter process. Nearly all the German steel and the greater part of that produced in the United States is basic, while in this country acid steel is mostly made, being more in demand. In the United States and Germany a larger proportion of pig-iron is converted into steel than in the United Kingdom. During the years 1900-2, the United States produced on an average 81 tons of steel for every 100 tons of pig-iron consumed for all purposes, and in Germany 78 tons, whereas in the United Kingdom the proportion was only 64 tons. Belgium manufactures about the same amount per 100 tons of iron, and France a little less. Several metals are frequently added to steel which impart to it qualities desirable for certain special purposes. Manganese, besides being used in the manufacture to remove impurities, is added in the proportion of about 12 per cent., forming a very hard and ductile steel used for rock-crushing machinery, safes, etc. Armour plates contain 3 to 5 per cent. of nickel, sometimes with the addition of chromium, and boiler tubes are made with 25 to 30 per cent. of nickel. This steel is also used in electrical apparatus, having a high electrical resistance and a low temperature co-efficient. Tungsten and molybdenum combined with nickel or chromium make useful steels, and vanadium steel is claimed to be the best for motor-car construction.




As here shown the United States produces about 40 per cent. of the total steel manufactured. As an exporter of the products of the iron and steel industries, the United Kingdom takes the first place. The value of its exports was about 34 million sterling in 1904, and more than 38 millions in 1905. Germany exported 26½ million pounds' worth in 1904; the United States 14½ million pounds' worth in 1904 and about the same amount in 1905.

## AVERAGE ANNUAL PRODUCTION OF STEEL IN PRINCIPAL COUNTRIES
DURING LAST 27 YEARS






Last year (1905) the steel industry was particularly active, especially in the United States, where the production of pig-iron amounted to 23 million tons. In the United Kingdom there was a much increased production of open-hearth steel, the output of steel ingots being 3,879,000 tons, or 634,000 tons more than in 1904. The United States produced 8,971,000 tons of open-hearth against 5,908,000 in the preceding year.

# COAL - MINING COUNTRIES



GREENLAND
ALASKA
DOMINION OF CANADA
UNITED STATES
MEXICO
WEST INDIES
ATLANTIC OCEAN
PACIFIC OCEAN
BRAZIL
ARGENTINE REPUBLIC
BRITISH ISLES
RUSSIAN EMPIRE
SIBERIA
SAHARA
ARABIA
INDIA
CHINESE EMPIRE
JAPAN
EAST INDIES
INDIAN OCEAN
WESTERN AUSTRALIA
QUEENSLAND
NEW ZEALAND
CAPE COLONY

**EXPLANATION OF COLOURING**

Coal Districts
Lines of Export

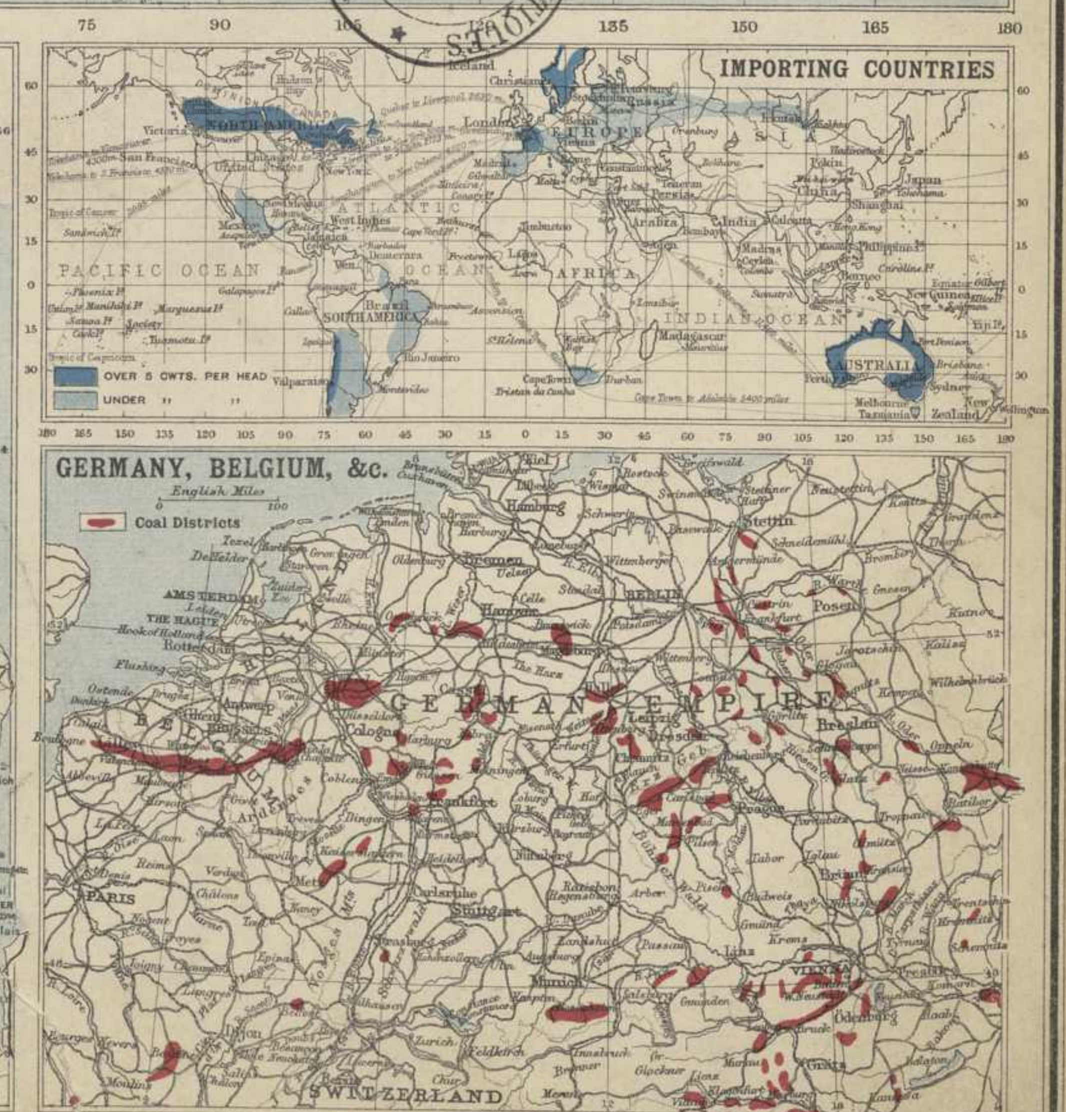








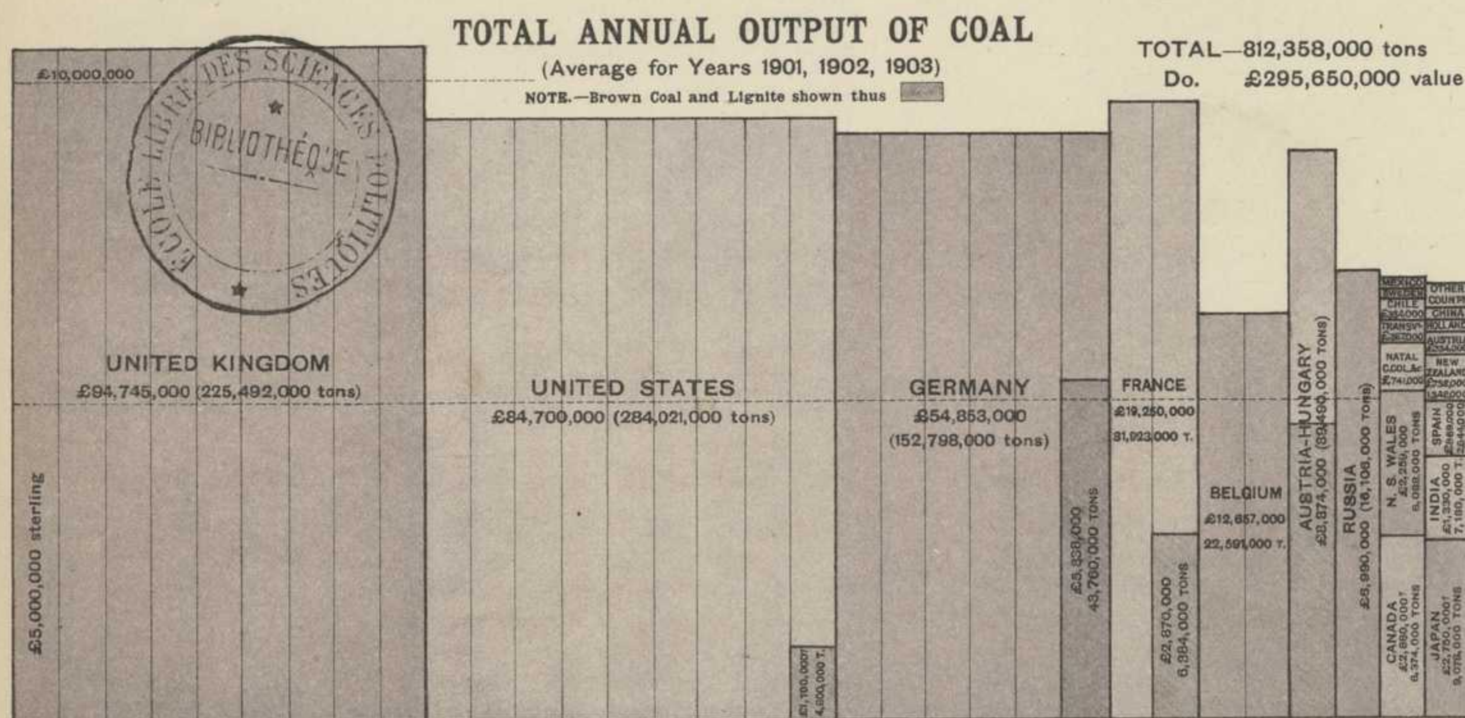





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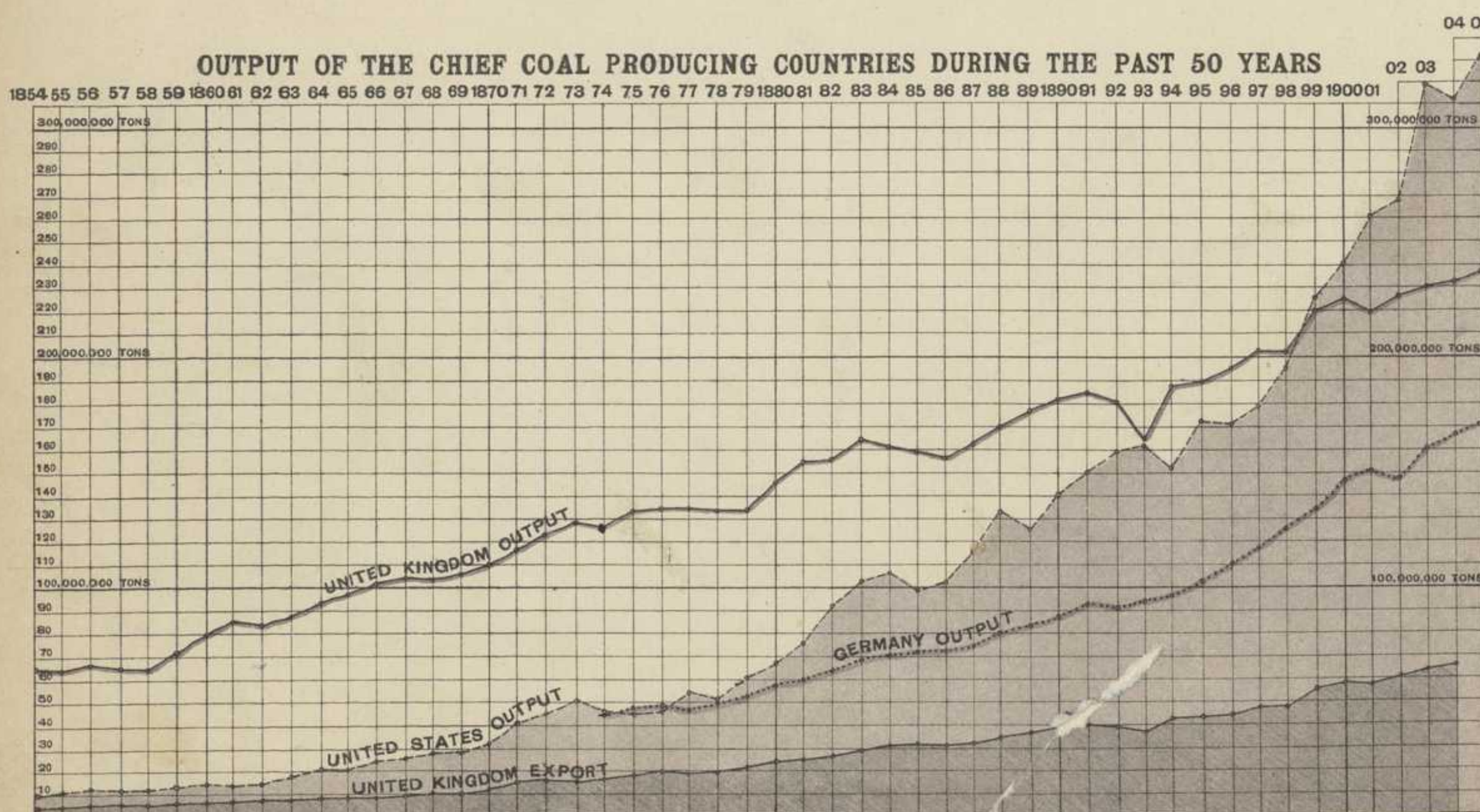
# COAL

**General Summary.**—Coal is a light, black or dark-brown substance formed by the alteration of the remains of forests and peat-mosses, which grew in far distant geological ages. It is found in strata of many different ages, but the most important coal-fields belong to the upper measures of the Carboniferous system. Coal consists principally of carbon, hydrogen, and oxygen, the harder kinds have lost a larger proportion of their gases. Whereas wood contains more than 12 parts of hydrogen and 83 parts of oxygen to 100 of carbon, anthracite, the hardest kind of coal contains less than 3 parts of hydrogen and about 1¾ of oxygen. This kind gives out great heat and is used in furnaces. The chief anthracite deposits are in Wales and Pennsylvania, where the average output for the years 1901 to 1903, was 54,510,000 tons. Of bituminous coals the hardest are steam coal and cannel (candle) coal, used chiefly for the production of gas. There are also caking and non-caking coals. The former swell up under the action of heat into a spongy mass, give off much smoke, and are most suitable for the manufacture of coke, while the non-caking varieties burn with a bright flame. Lignite, the harder kinds of which are often called Brown Coal, is intermediate in character between peat and coal, still containing a considerable volume of gas, and often showing a fibrous structure As a rule it is smoky and gives out little heat, but much of the American lignite is little inferior to bituminous coal. Coal seams vary in thickness, from an inch or two up to forty feet and more. Those less than two feet thick are seldom worked. Coal occurs in nearly all parts of the world, from Alaska, Spitzbergen and Siberia, in the northern hemisphere, to Argentina, and Australia in the south, but the greatest production is in the temperate countries of the northern hemisphere where manufactures flourish and wood-fuel is scarce. Great Britain, France, and Germany, contain the most important coal-fields in Europe, the coal of the southern and south-eastern countries being chiefly lignite. There has been much discussion of the question, how large are the coal supplies of the United Kingdom? and a Royal Commission after inquiries made in 1903 and 1904, reported that the available coal resources in seams of 2 feet thick and upwards, and lying within a depth 4000 feet, are fully 100,914 million tons, while the geological committee estimated the resources of the concealed and improved coal-fields at nearly 39,484 million tons. How long this supply will last it is impossible to foretell. Probably the output will not long continue to increase at its present rate, and coal will be economized by the use of oil and other sources of heat. The United States contain far more extensive coal-fields, the bituminous areas covering in the aggregate more than 335,000 square miles, and anthracite underlying an area of about 484 square miles in Eastern Pennsylvania, and also occurring in two small deposits in the Rocky Mountain region. China, also, has very large coal-fields, at present worked to a comparatively small extent. In New South Wales there are said to be 150,000 million tons and the same quantity in Queensland, while Victoria possesses great masses of brown coal.





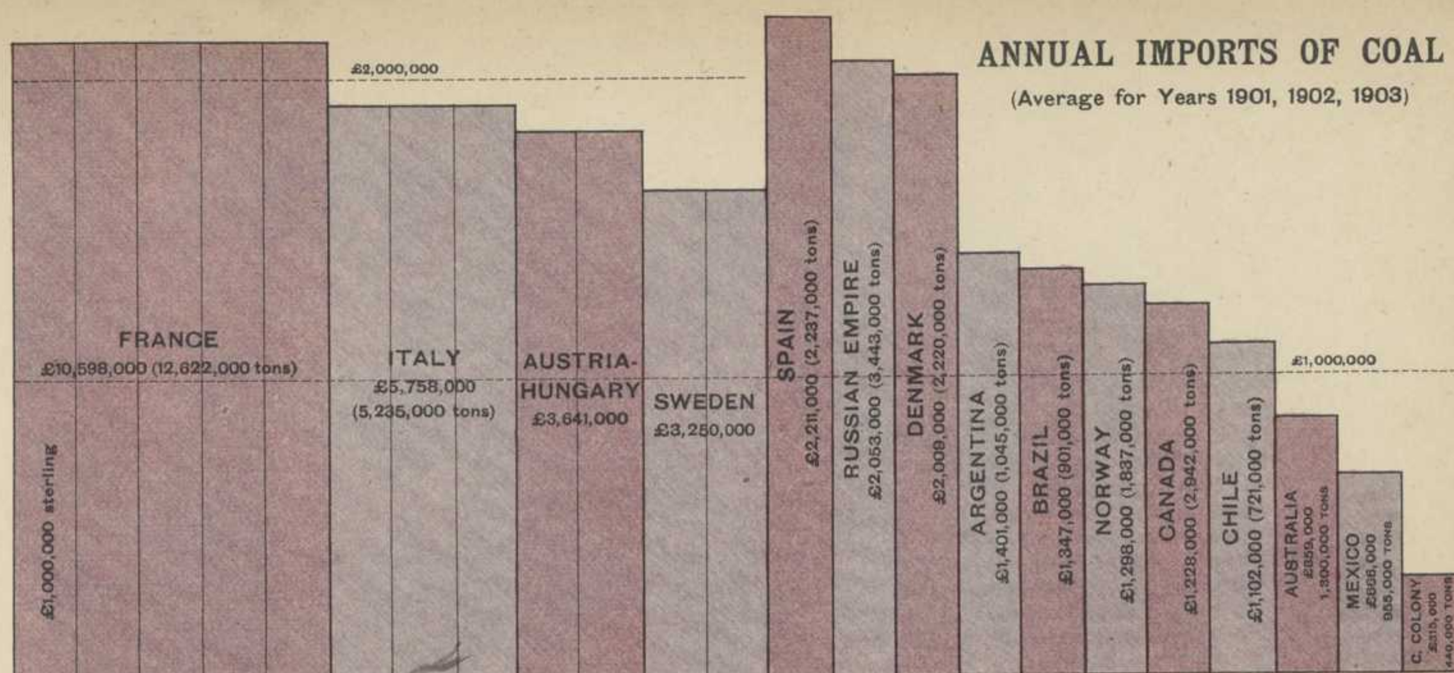
The United Kingdom occupies the first place only as regards value. The figures representing weights show that the output of the United States is considerably larger (see the next diagram). The shaded portions indicate the production of lignite, the quantities and values being included in the larger figures.




The outputs of the United Kingdom and Germany are represented by fairly regularly ascending curves, the latter gradually approaching the former, while the United States is producing rapidly increasing quantities, and will probably continue so to do, considering the vast coal-fields [illegible] ry.

## ANNUAL IMPORTS OF COAL

(Average for Years 1901, 1902, 1903)

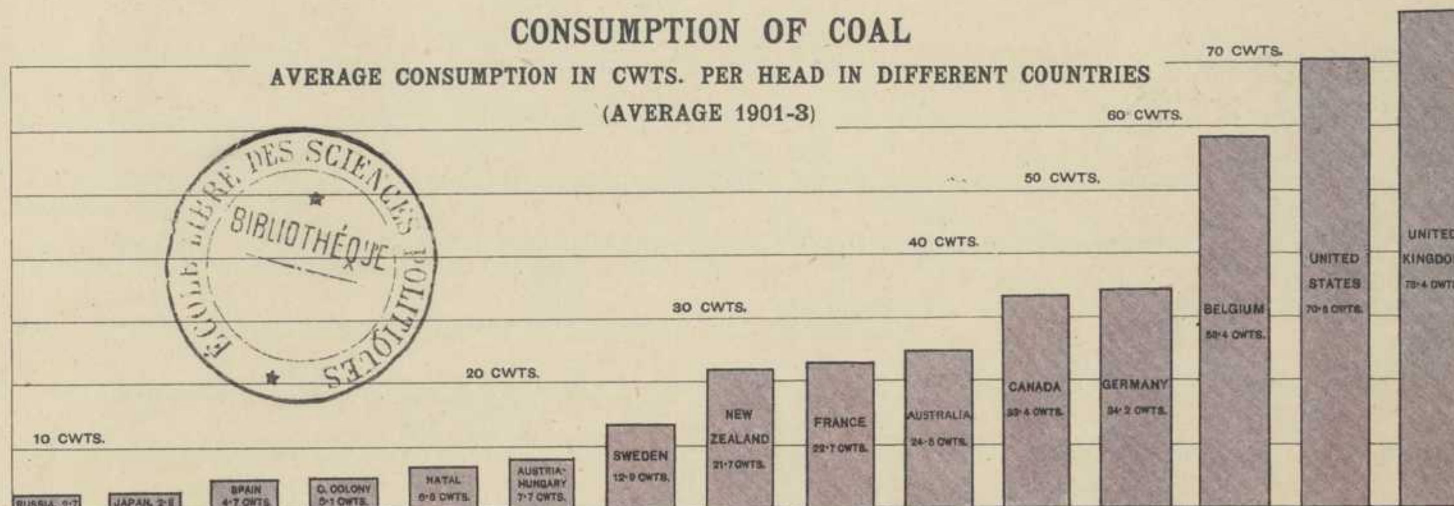



France is the first of the importing countries. Her coal-fields, the most important in the north-east and centre, being small in proportion to her area and population, and the west especially consuming a large quantity of British coal. The imports into Italy are fast increasing, and for the year 1905 considerably exceeded six million tons. Sweden having little coal of her own, is obliged to import fuel to work her minerals.

## CONSUMPTION OF COAL

AVERAGE CONSUMPTION IN CWTS. PER HEAD IN DIFFERENT COUNTRIES

(AVERAGE 1901-3)

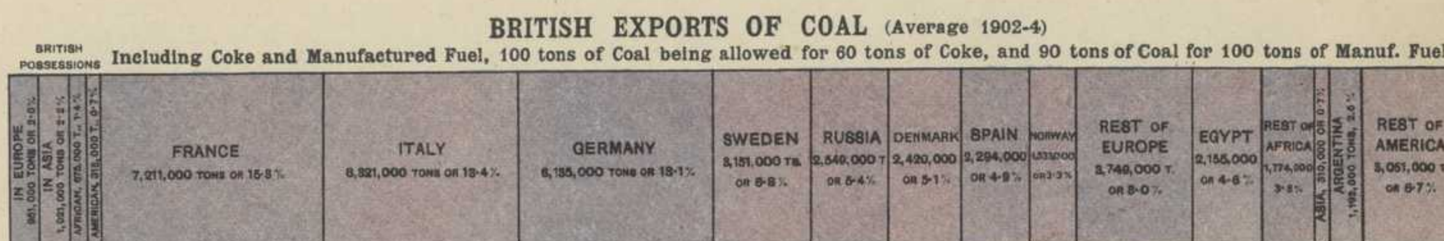





The United States, the United Kingdom, and Belgium, being great industrial countries, naturally consume a large quantity of coal. The smaller consumption in many of the other countries is due to the use of wood as fuel, especially in heating houses. In some cases a warmer climate, and a more economical use of fuel, account for the small consumption.

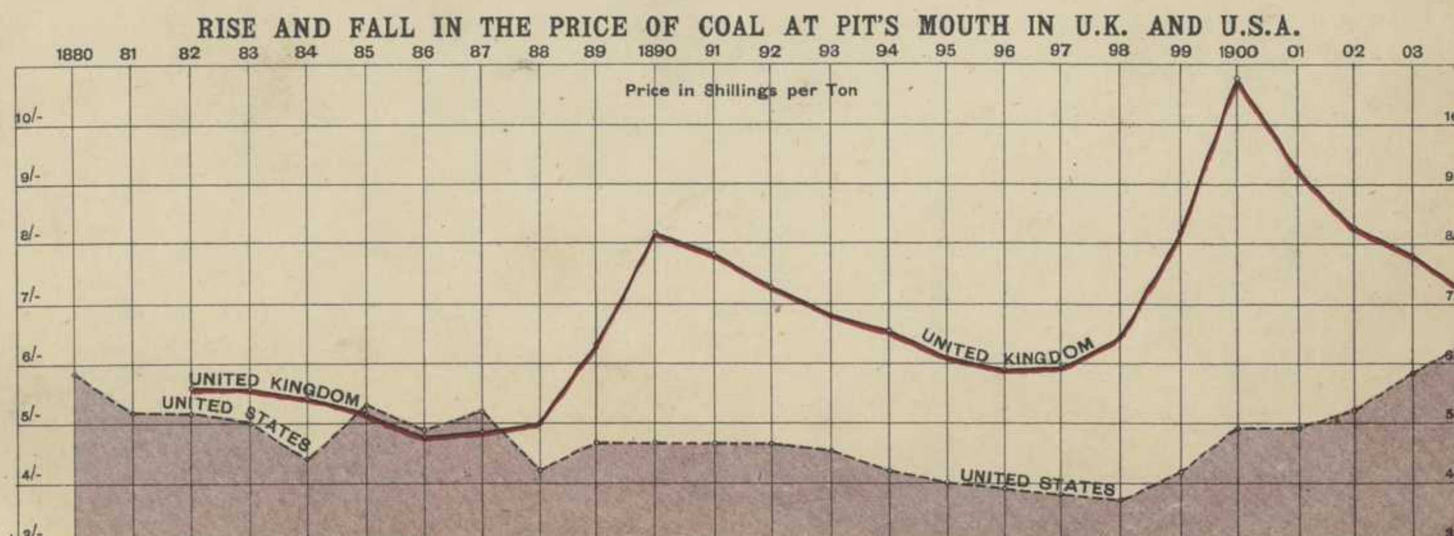
## BRITISH EXPORTS OF COAL (Average 1902-4)

Including Coke and Manufactured Fuel, 100 tons of Coal being allowed for 60 tons of Coke, and 90 tons of Coal for 100 tons of Manuf. Fuel



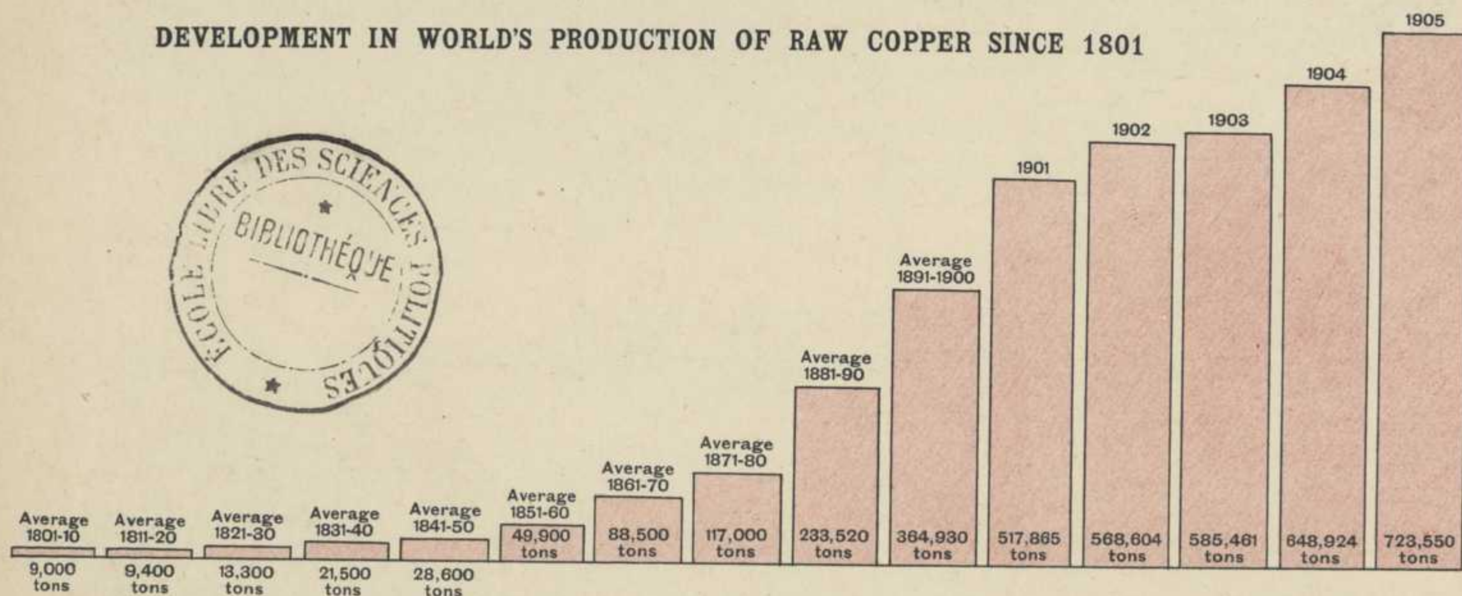

The exports of British coal increase steadily but at rather a lower rate each succeeding decade. France, Italy, Germany, and Sweden, take larger quantities almost yearly. Besides the above, considerable quantities—in recent years, 15 to 17 million tons—are stowed in the bunkers of ships engaged in foreign trade, and make up the totals on which the curve of exports in another diagram is founded. It may seem strange that Germany does not appear in the diagram of imports. The reason is that it is a large exporting country also, its exports exceeding its imports.

## RISE AND FALL IN THE PRICE OF COAL AT PIT'S MOUTH IN U.K. AND U.S.A.

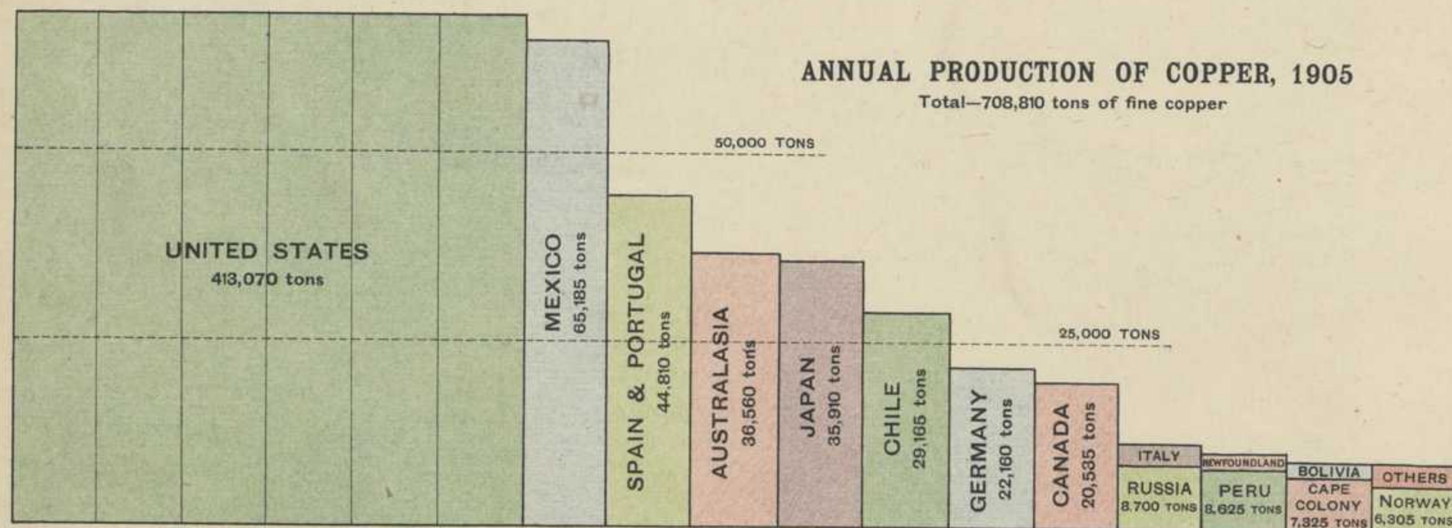


# COPPER.

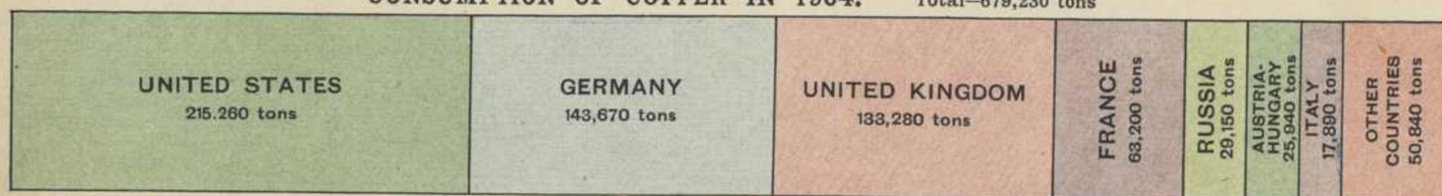
**General Summary.**—As may be seen from the map, copper is a widely distributed metal. Native copper is found in the peninsula of Michigan on the shore of Lake Superior, in Arizona, Siberia, South America, and Australia, and the sulphides (copper glance, indigo copper, and copper pyrites) are important ores. The oxidized ores are less valuable as sources of the metal, but malachite is a well-known ornamental stone; it is found in Siberia, Cornwall, Australia, and Arizona. Copper is a reddish metal, very tenacious, easily malleable and ductile, and therefore can be made into piping and tubing by pressure alone. Being a good conductor of heat it is used for fire boxes and boiler pipes, and it is also one of the constituents of brass and various kinds of bronze and other alloys. As a conductor of electricity it is, when pure, second only to silver, and hence its extensive use in electrical machinery, telegraph and telephone wires, &c. Electrotyping and engraving are other processes in which it is applied. Of the salts the best known is the sulphate, commonly known as blue vitrol and used in calico-printing and electrotyping and for destroying weeds. Copper arsenite is a green powder known as Scheele's green, and cuprous oxide imparts a ruby red colour to glass. Easily worked and forming hard alloys, copper has been worked from remote ages, and in modern days its excellence as a conductor of heat and electricity has caused a large increase in the consumption, which at the present time threatens to outstrip the production, though the output of most of the producing countries has been steadily growing, and therefore new sources of supply are eagerly sought for. New mines are being developed in South Africa (Rhodesia and the Transvaal). Argentina, where new mines have been discovered, will no doubt increase its output, now very small, as its railways are extended. In Mexico mining of minerals including copper has made great progress of late, and quite recently deposits of copper, said to be of exceptional quality, have been discovered in Greenland.



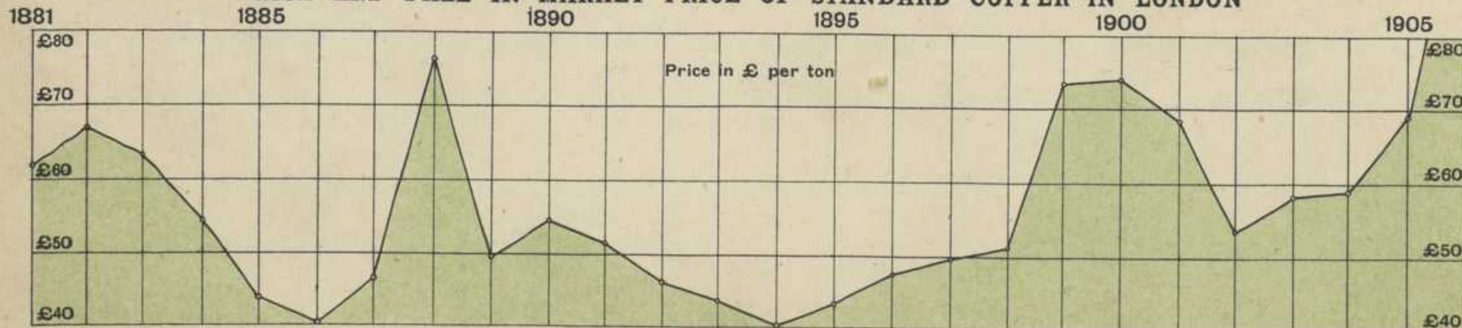





Many countries show a very large increase of output. Mexico and Canada each produce fully five times as much as they did ten years ago, Australasia 3½ times, and the United States fully 2¼. Japan produces twice as much and Peru 19 times, but the total output of the latter is still small. Spain and Portugal on the other hand show a decrease of more than 18 per cent.




It will be noticed that the consumption in this year considerably exceeded the production. In 1905 the European consumption fell, but has been greater in the first half of the present year, though not so large as in the same period of 1904.




The price in 1905 shows a marked rise compared to that of the preceding year. Throughout the present year the price has continued to rise rapidly, and now (October 1906) has reached £98 a ton.

# COPPER

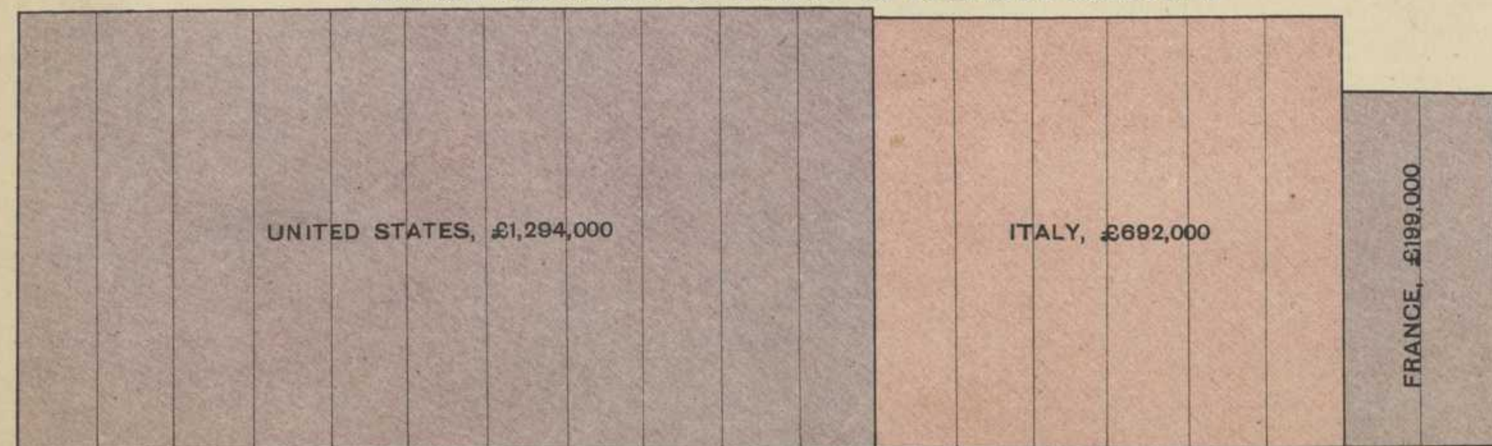


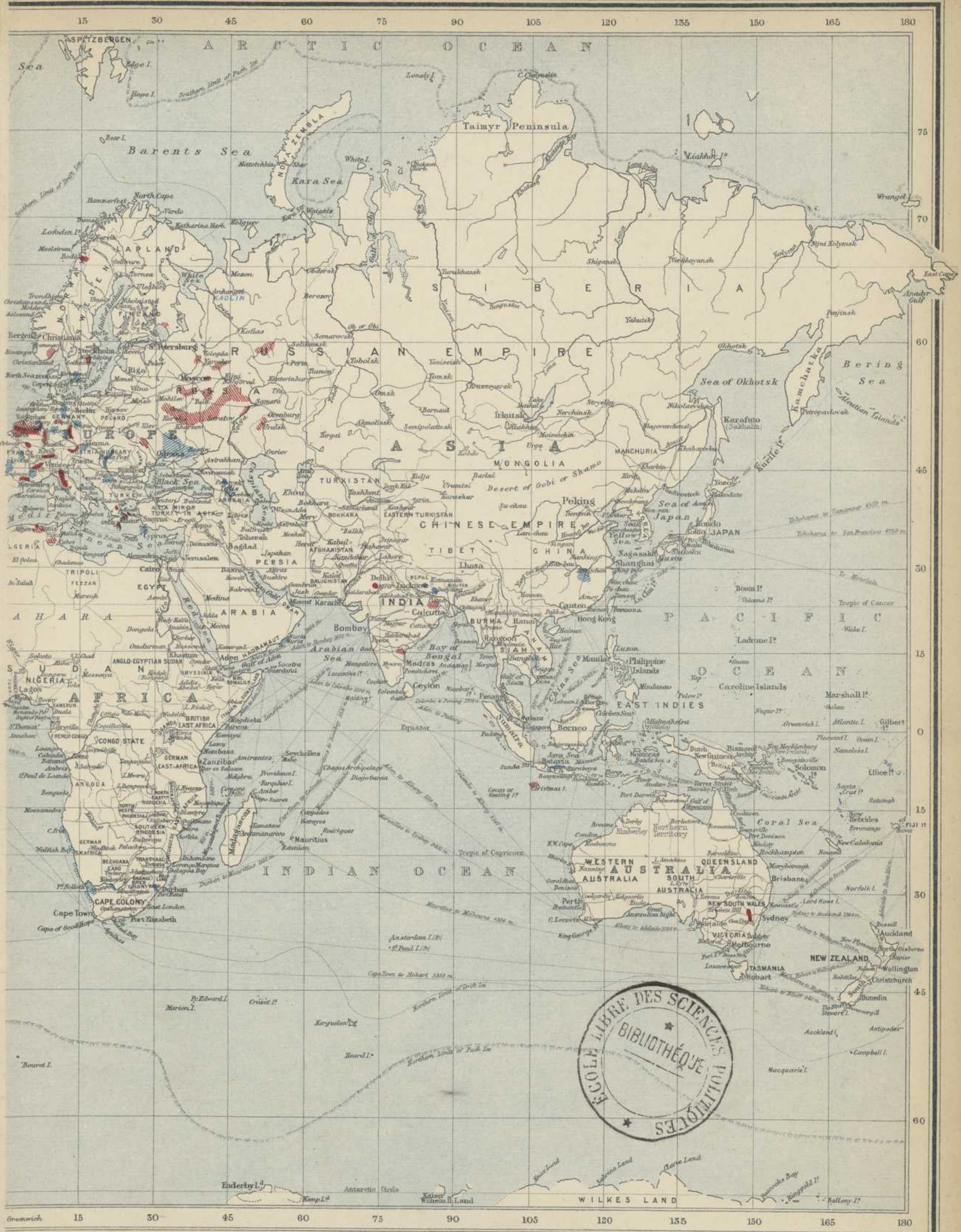


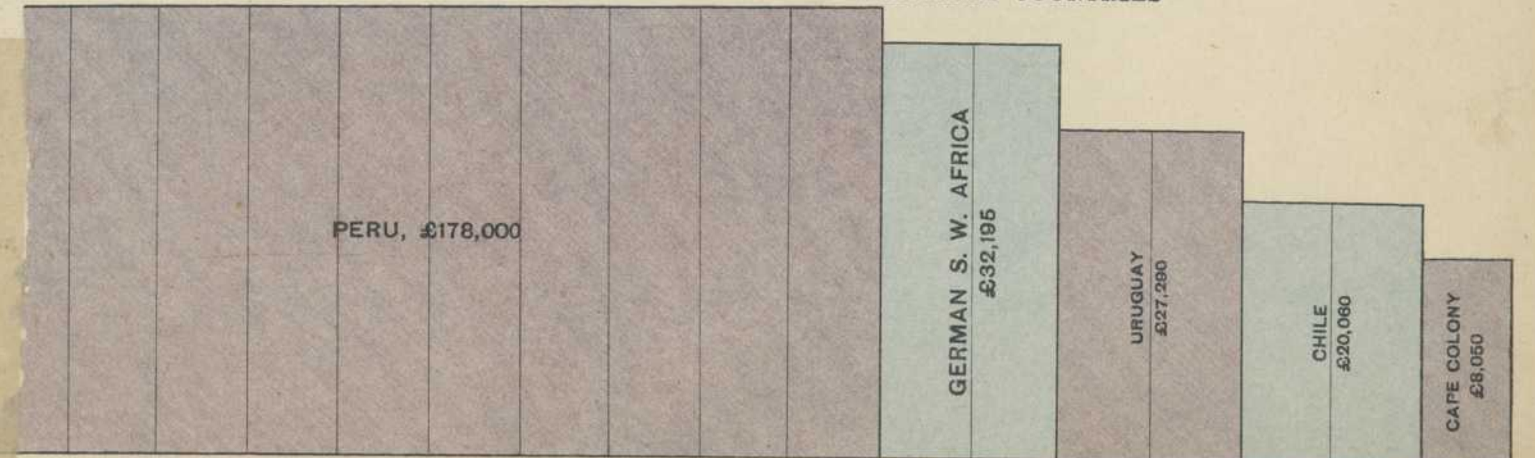



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# TIN, PLATINUM, ALUMINIUM &c.



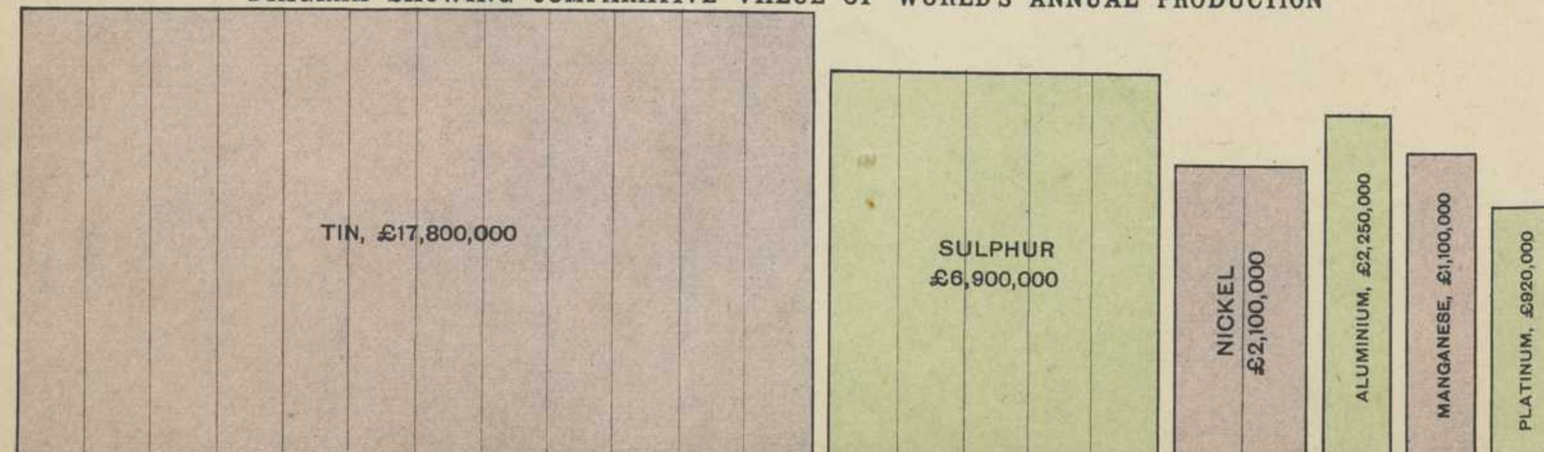
**EXPLANATION OF COLOURING**

- Tin
- Platinum
- Aluminium
- Nickel
- Manganese
- Sulphur

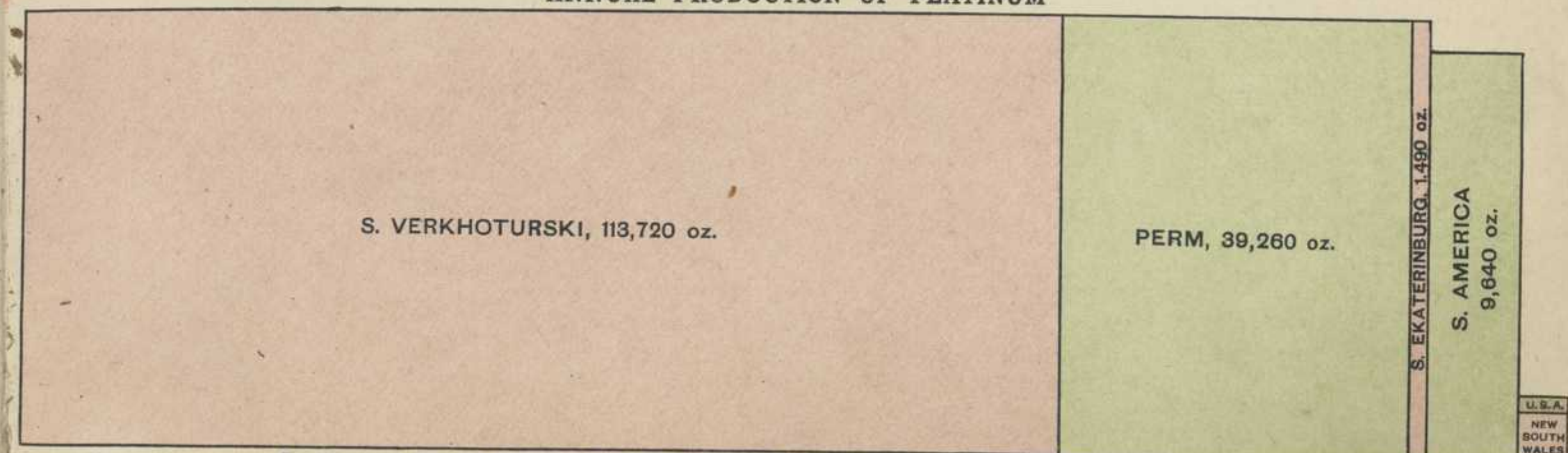




## DIAGRAM SHOWING COMPARATIVE VALUE OF WORLD'S ANNUAL PRODUCTION



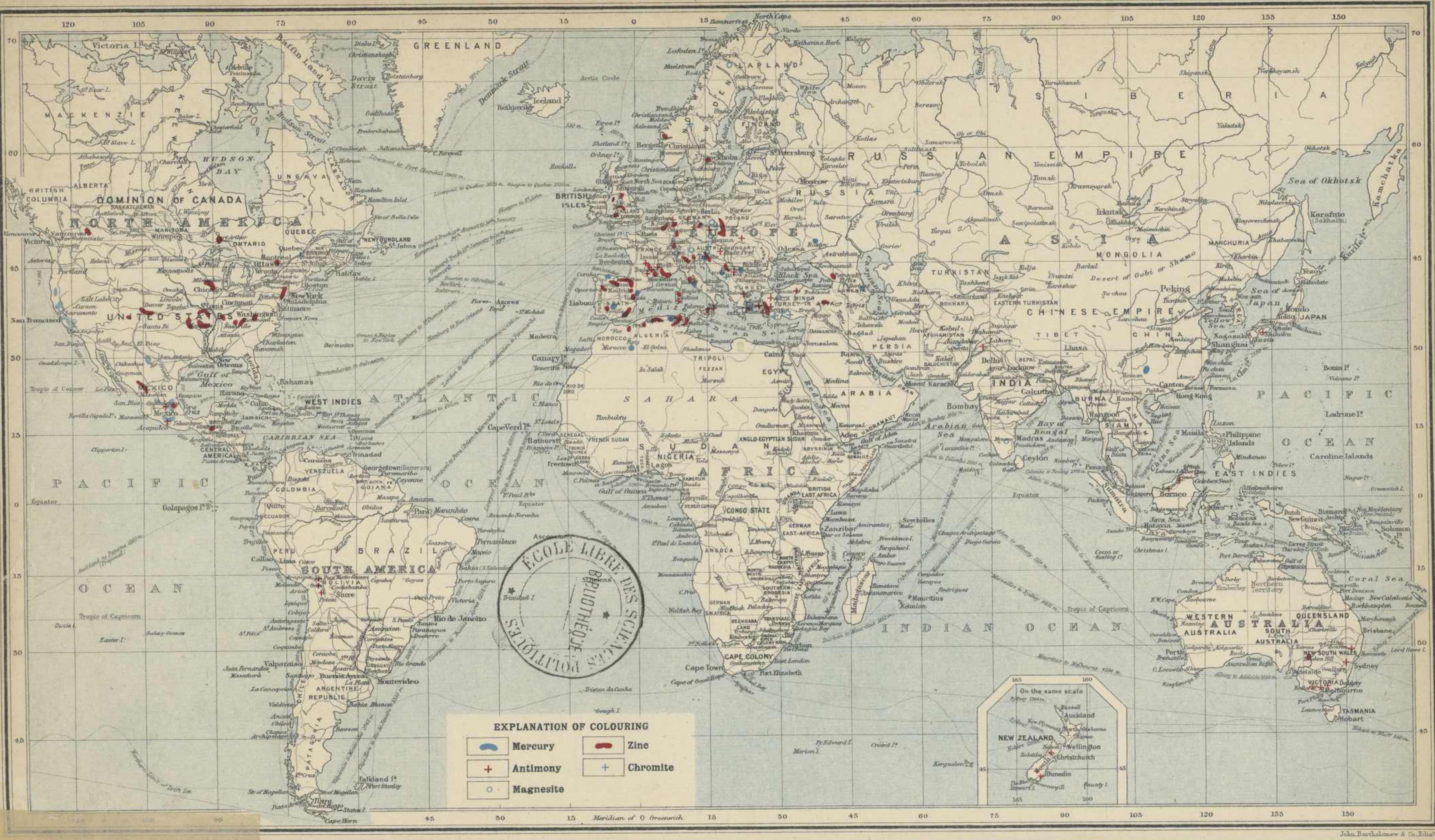

## ANNUAL PRODUCTION OF PLATINUM




For Diagrams showing Production of Tin, Aluminium, Nickel, Manganese, and Sulphur, see "List of Commodities."

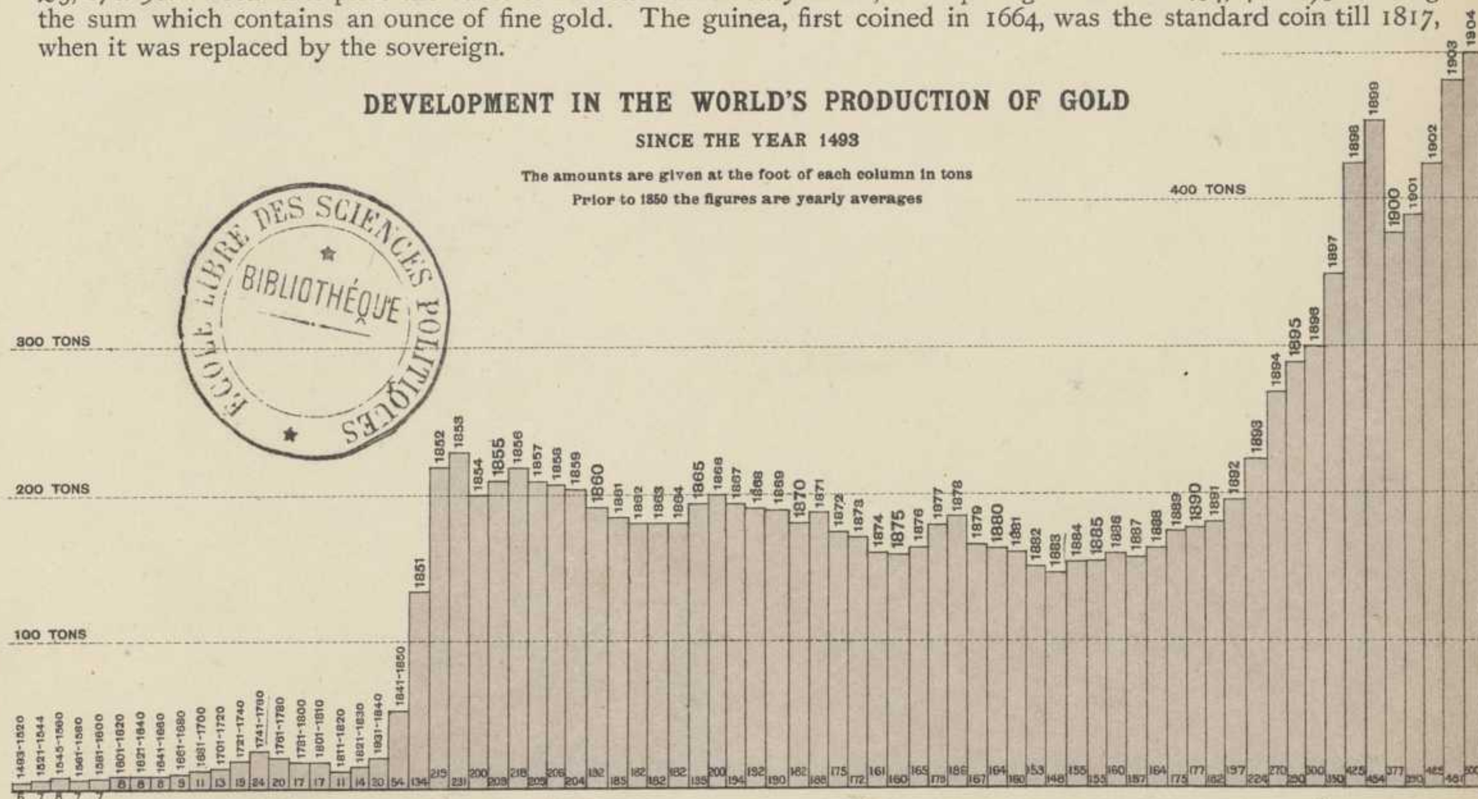
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# MERCURY, ZINC, ANTIMONY, &c.



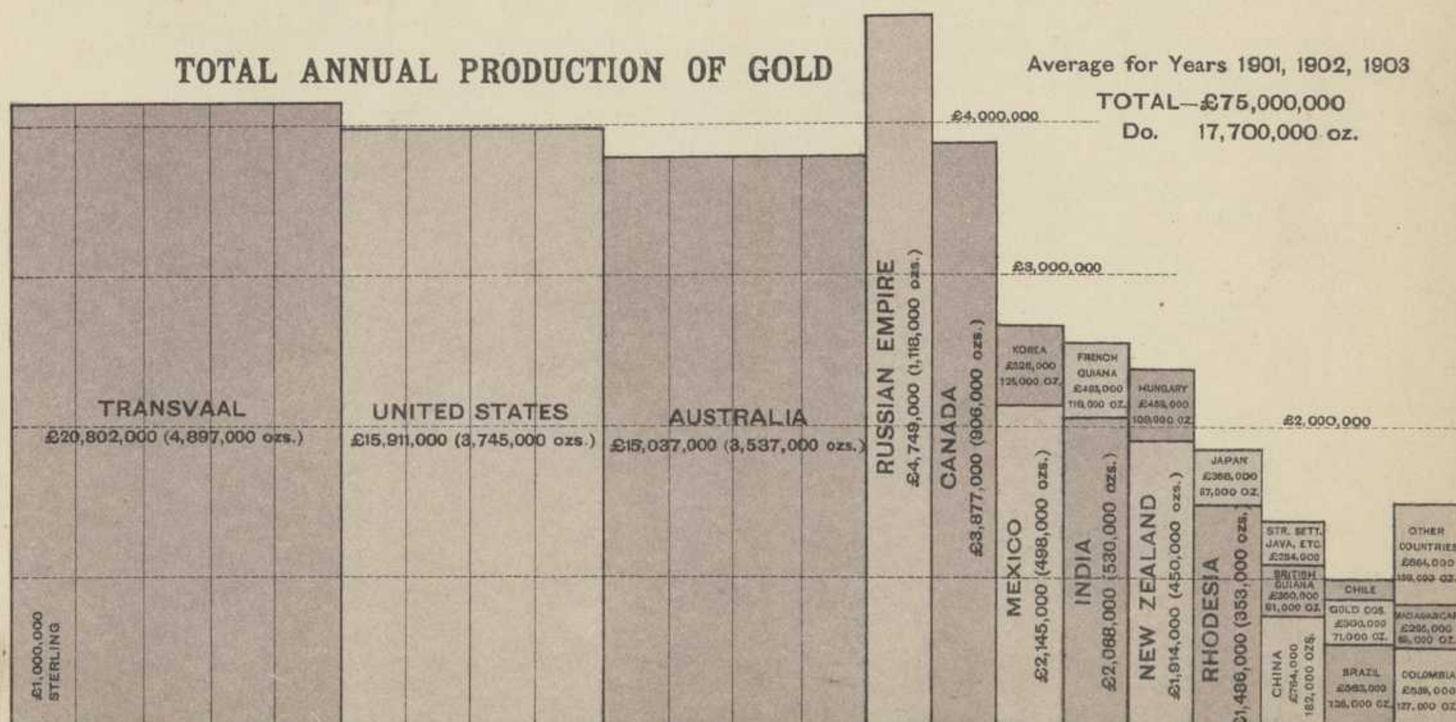
# GOLD.

**General Summary.**—Gold is one of the most widely distributed of metals. It is found in all the continents and in almost every country, It belongs to every geological period, though it occurs more abundantly in certain systems, and is especially frequent in volcanic districts. Most of the gold obtained is native, minerals containing gold being very rare; telluride, a compound of tellurium and gold, occurs in Colorado and elsewhere. It is either embedded in rock, especially in quartz veins, or in alluvial deposits (placers), from which the ore is extracted by washing, while the solid rock is first crushed and stamped into powder. From "free-milling" ores the metal can be separated by mercury, which forms an amalgam with the gold and is afterwards removed by heat. Tellurides, however, and ores containing sulphides demand a chemical treatment. The chlorination process, in which gold chloride is formed by the application of chlorine gas, is still in use, but the cyanide process, in which the gold is dissolved by cyanide of potassium or sodium, has nearly superseded it. In shallow placers gold is often washed out by hand washing or with very simple apparatus, but a large proportion of the metal is then lost—in some cases as much as 50 per cent.; as, however, no capital is required, this process can be adopted by poor miners, working singly or in small parties. In these diluvial deposits large nuggets are sometimes found. Gold is nearly always associated with silver, which is removed by sulphuric acid. Gold is very heavy (sp. grav. 19.3) and is extremely malleable and ductile. Being very valuable, it is much used in jewellery, plate, and ornaments, alloyed with copper, silver, iron, &c., to give it hardness and vary the colour. For decorative purposes it is employed in the forms of gold leaf and gold wire. A grain of gold is usually beaten out to an area of 56 sq. inches, when it becomes so thin that a greenish light can be seen through it. The leaves thus made are laid on picture frames and other decorative articles. Wire is used in needle work, and 15 grains of gold are drawn out to a length of more than 2,000 yards. Chloride of gold is used to tone photographs. The most important use of gold is as a medium of exchange, and about a fourth of the metal obtained is absorbed by the mints of the world. Its high value compared to its volume and weight render it particularly suitable for this purpose, and now most of the civilized countries of the world have a gold standard. But it is only in recent times that gold has gained its present pre-eminence, though gold coins were struck in very early ages. In England gold was first coined in 1257, but gold and silver coins were equally legal tender till 1774, and it was not till 1816 that silver as a legal tender was limited to 40 shillings and the silver coins reduced to token coins. At the reformation of the coinage in 1774, it was enacted that a pound weight of gold should be coined into forty-four guineas and a half, which would make the value of an ounce of standard gold (22 carats fine) £3, 17s. 10½d., but owing to the loss of interest while the gold lay in the mint, the price was usually £3, 17s. 6d., until the Bank Charter of 1844 obliged the Bank of England to give notes for bullion at the rate of £3, 17s. 9d. From this price the value of bullion cannot vary much, while pure gold is worth £4, 4s. 11½d., being the sum which contains an ounce of fine gold. The guinea, first coined in 1664, was the standard coin till 1817, when it was replaced by the sovereign.





This diagram shows how small the production of the world was until the middle of last century, when the mines of California and Australia were discovered. Improved methods of extracting the gold have of late tended to increase the production. The rise during the past decade is due to increased production generally, and the discovery of new deposits, and more especially to the development of the South African gold-fields, as shown on another diagram. The output of 1905 was considerably larger than that of 1904, probably amounting to about 541 tons of the value of 75 million sterling. See the diagram showing the production of South Africa and the United States.




The production for the year 1905 has been taken in the case of the Transvaal, as the output will probably be still further increased if the present supply of labour is maintained. In Rhodesia, also, and Madagascar, the average would not have represented the present state of the industry. Of small fields the West African has made most relative progress, its output in 1905 being more than five times that of 1902.

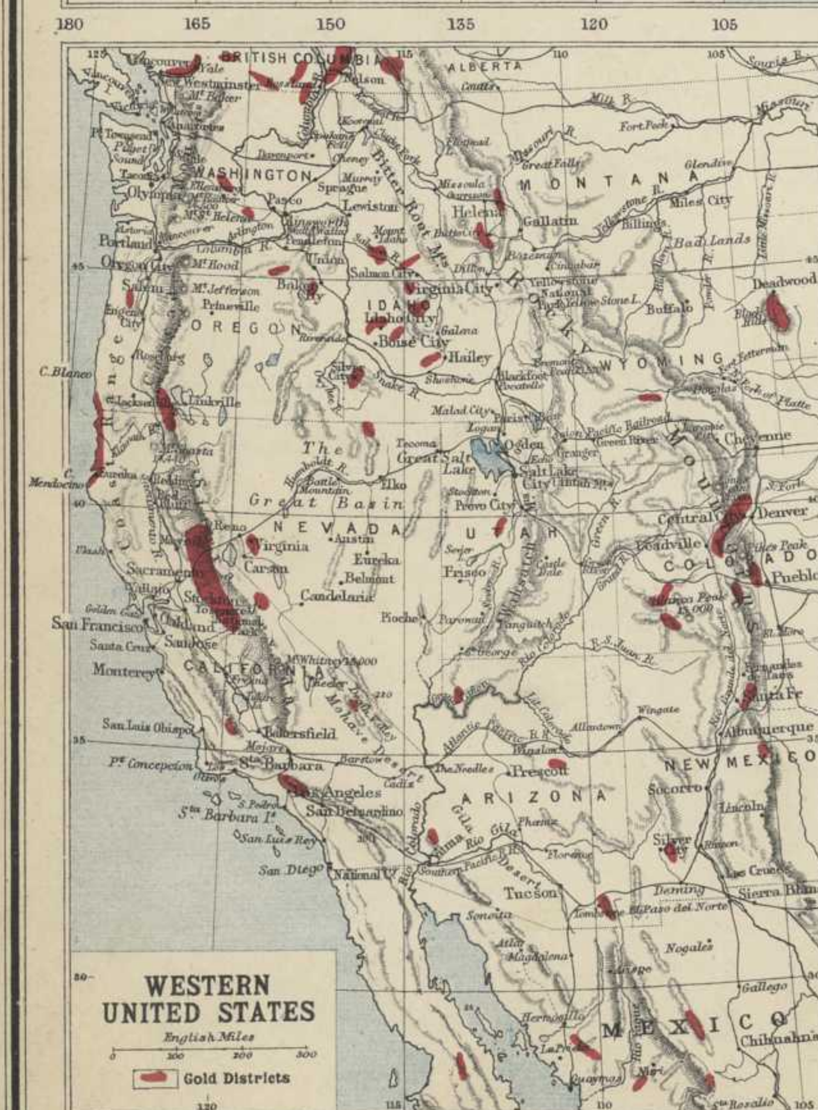
EXPLANATION OF COLOURING

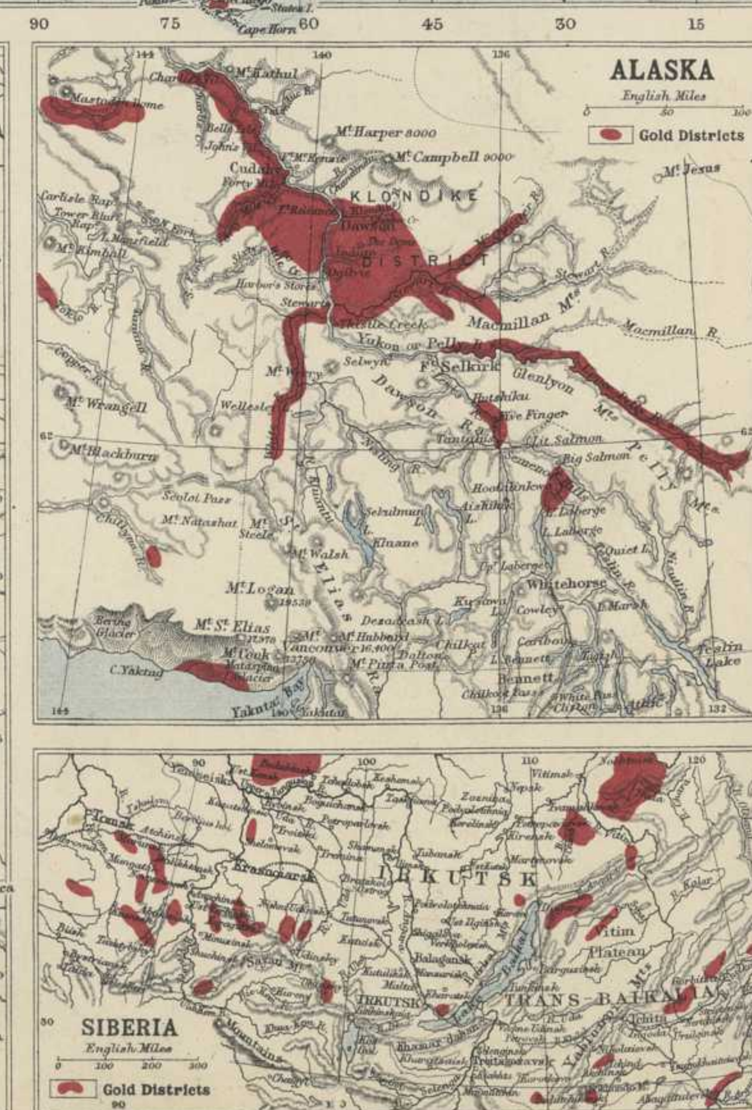
Gold Districts

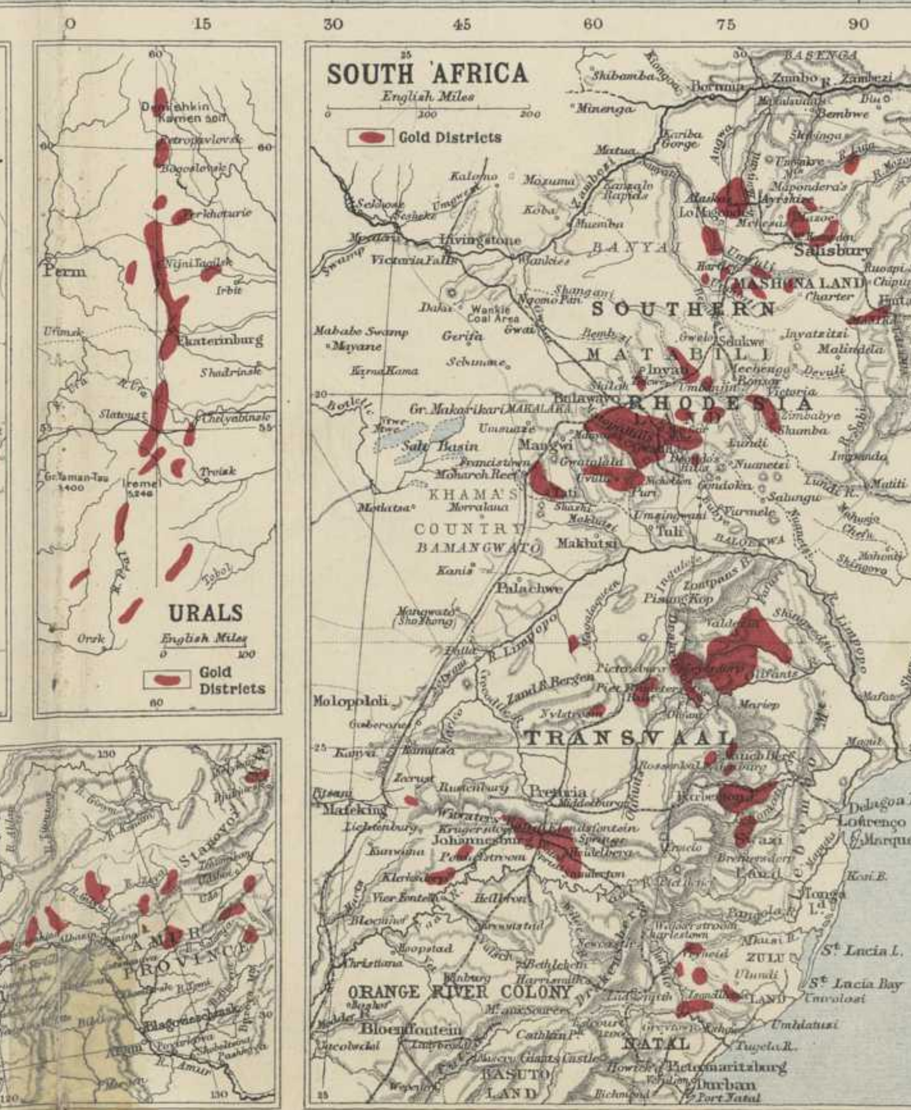
Lines of Export

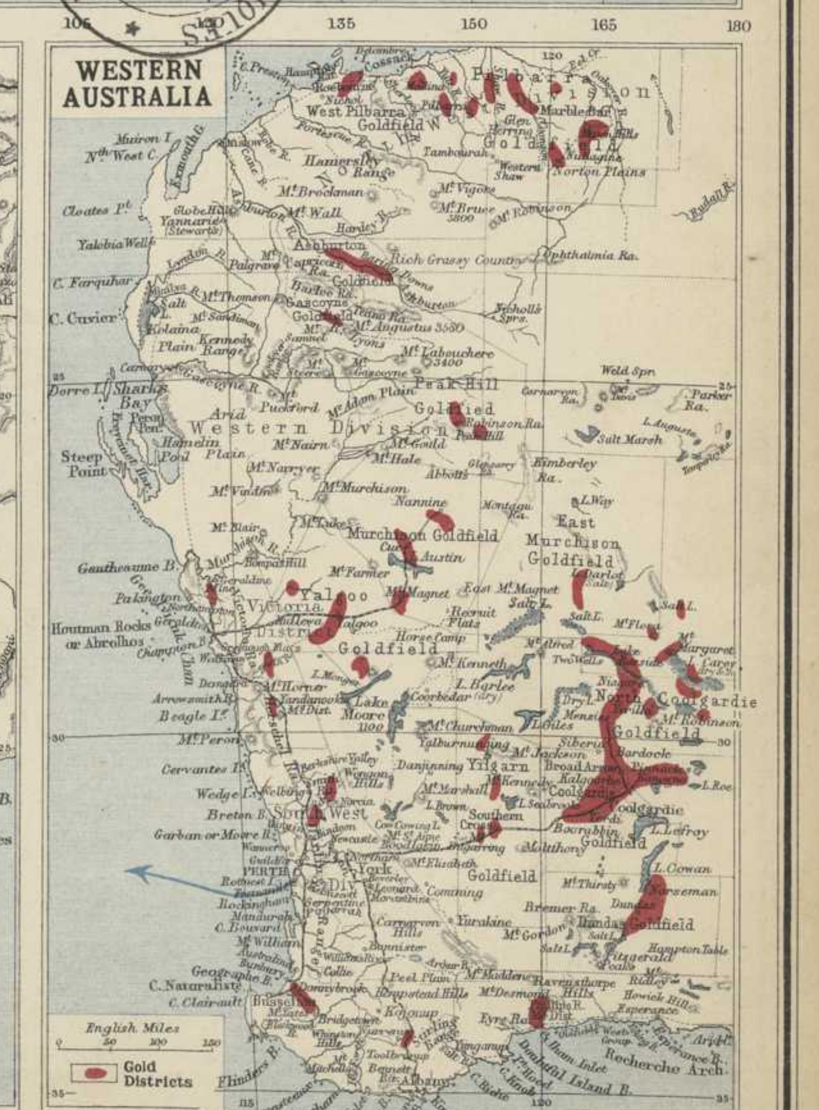






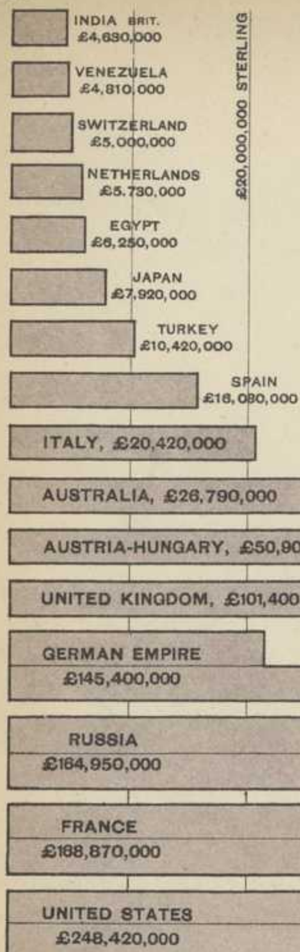



## STOCKS OF GOLD COIN IN DIFFERENT COUNTRIES

(Average for Years 1900, 1901)







ITALY, £20,420,000
AUSTRALIA, £26,790,000
AUSTRIA-HUNGARY, £50,900,000
UNITED KINGDOM, £101,400,000
GERMAN EMPIRE £145,400,000
RUSSIA £164,950,000
FRANCE £168,870,000
UNITED STATES £248,420,000

£30,000,000 · £40,000,000 · £50,000,000 · £60,000,000 · £70,000,000 · £80,000,000 · £90,000,000 · £100,000,000 · £110,000,000 · £120,000,000 STERLING

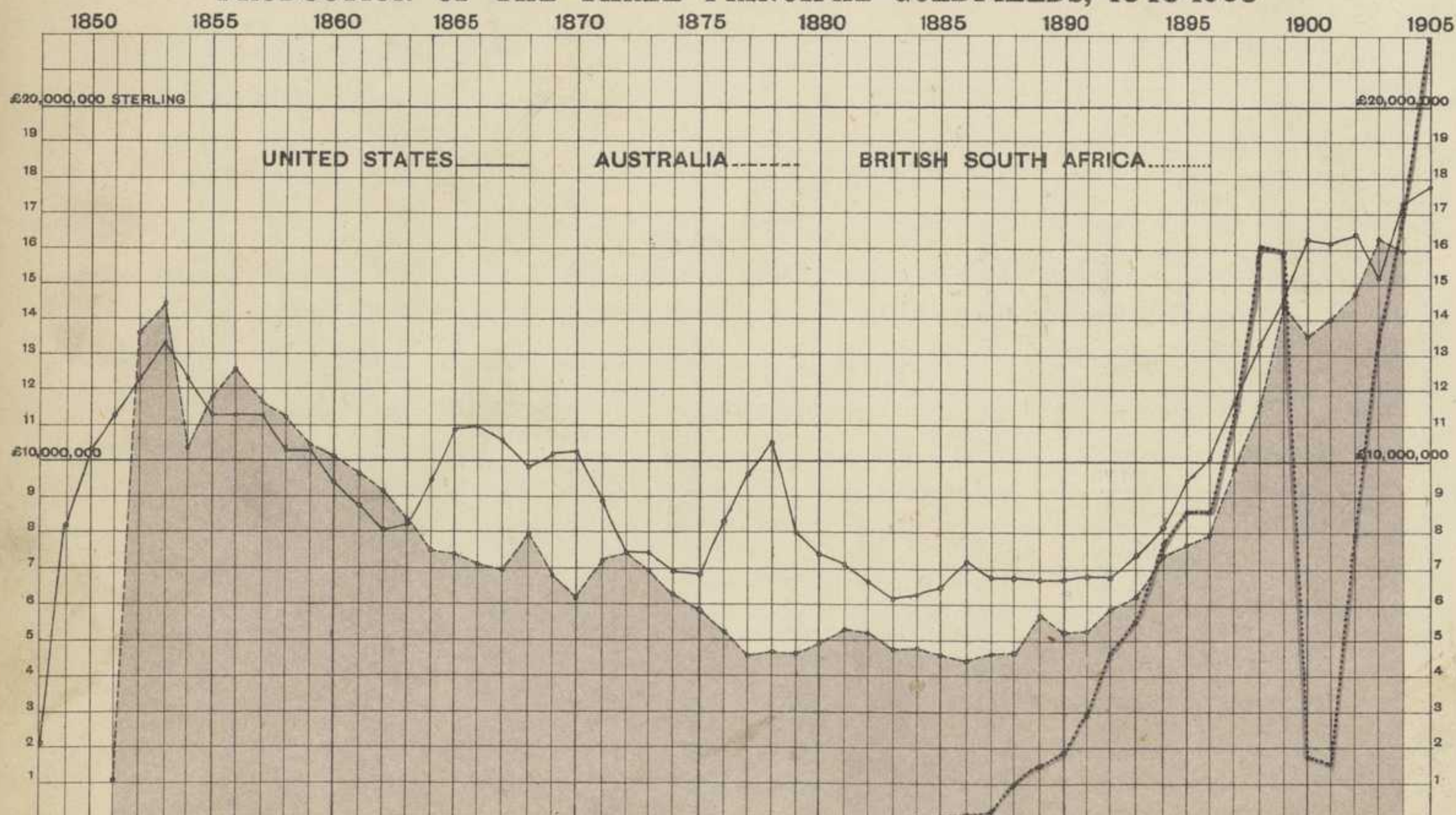



## GOLD-BRITISH IMPORTS OF BULLION (Average 1902-4)

BRITISH SOUTH AFRICA 3,361,000 ozs. or 59·3 %
AUSTRALIA 985,000 ozs. or 17·4 %
BRITISH EAST INDIES 654,000 ozs. or 11·6 %
NEW ZEALAND 137,000 OZS. OR 2·4 %
BRITISH GUIANA 116,000 OZS. OR 1·9 %
BRIT. W. AFRICA, 0·8 %
BRAZIL 112,000 OZS. OR 2·0 %
COLOMBIA 99,000 OZS. OR 1·7 %
HOLLAND, 65,000; 1·2 %
OTHER FORN. COUNTRIES

Total, 5,664,365 oz. (£21,392,486). British South Africa has in the last few years risen to the first place, and Australia is forced to take the second place. As for the United States, which no later than 1900 imported into the United Kingdom more than a million oz., its imports have sunk to a few thousand.

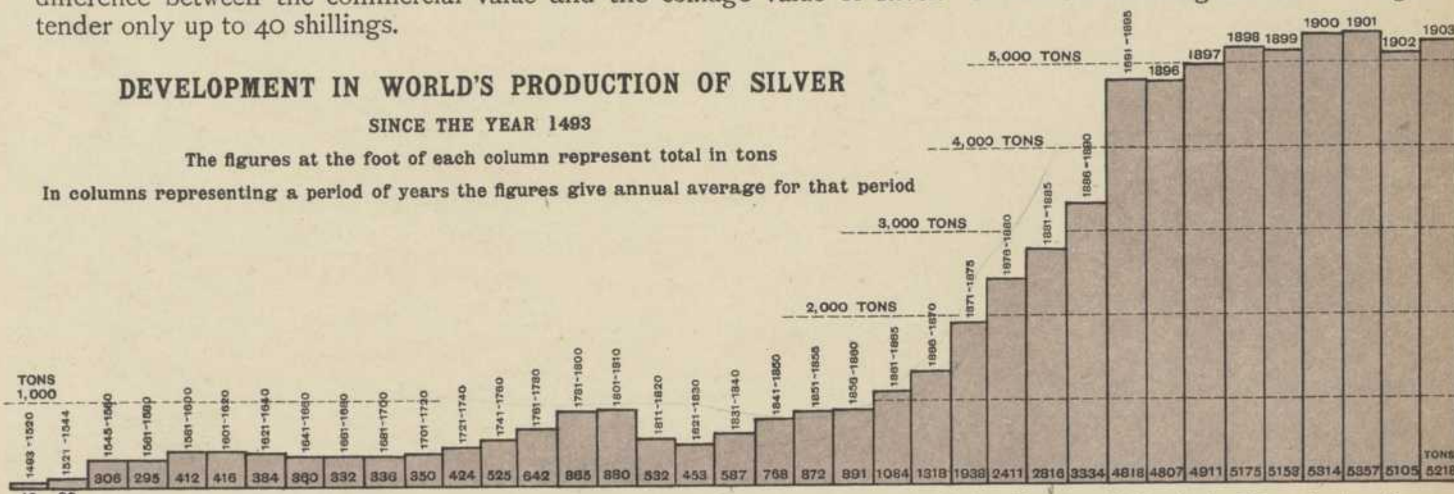
## PRODUCTION OF THE THREE PRINCIPAL GOLDFIELDS, 1848-1905



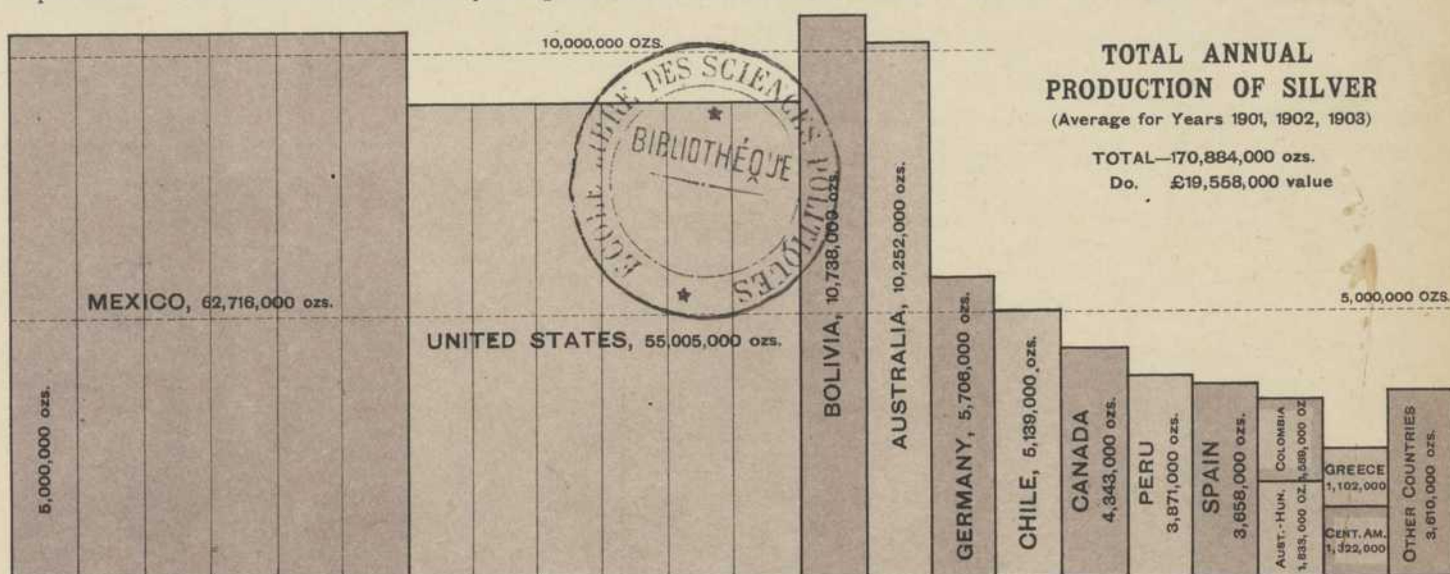

The production of the United States is here traced from the year 1848, when the Californian deposits were discovered. Three years later, in 1851, the precious metal was discovered in Victoria and New South Wales, which are still considerable producers, but more than half the output of the Commonwealth is obtained at the present time in Western Australia, and the rise in the curve in the last dozen years is in a large measure due to the development of the mines of that colony. The sudden growth of the South African mines is very remarkable. The fall in 1900 and 1901 is due to the war, and the small quantity represented was drawn chiefly from Southern Rhodesia.

# SILVER.

**General Summary.**—Silver sometimes occurs in a native state, as at Kongsberg in Norway, and in some of the mines of the United States, Mexico, Chile, and Peru. It is, however, more common in the form of argentite or sulphide of silver, pyrargyrite or sulph-antimonite, horn silver or chloride and other ores; and a large proportion, probably over 40 per cent., is obtained by the desilverization of ores of other metals, especially lead and copper. Silver is manufactured into ornamental articles, plate and jewellery, mixed with alloy for it is too soft to use alone, and is drawn into fine wire and beaten out into thin plates for decorative purposes. Nitrate of silver is the well-known lunar caustic, used in medicine, and, as well as other salts, in photography. The argento-cyanide of potassium and other combinations are employed in electro-plating. A large part of the supply of silver is minted. It was the chief coinage in most countries and the standard until the latter part of last century, and though a gold standard has been adopted by most states in Europe and their colonies, and in many American states, silver coin is still of importance and is in many countries legal tender to any amount. In Asia, silver is still the medium of exchange. English standard silver consists of 925 parts of pure silver to 75 of copper, and since 1816 a pound of standard silver has been coined into 66 shillings. As the price has fallen to less than half, there is now a great difference between the commercial value and the coinage value of silver. In the United Kingdom silver is legal tender only up to 40 shillings.

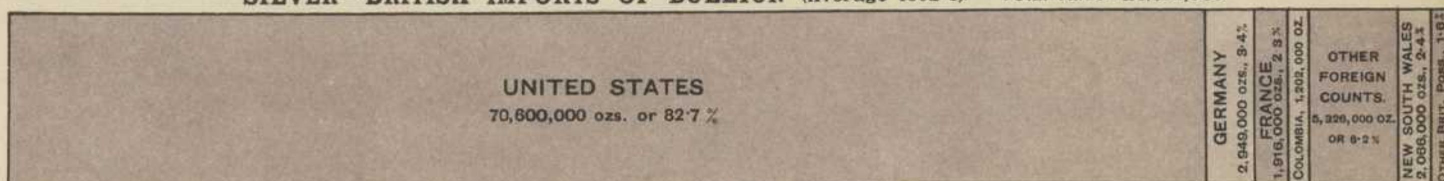



The great increase in the production commenced with the discovery of the Comstock Lode in Nevada in 1859. Previously the output of the United States was comparatively small, but then it rapidly rose, and new mines being discovered in other western states, especially California and Colorado, the United States became the largest producer. Mexico has also in later years produced an increasing quantity. See the next diagram.

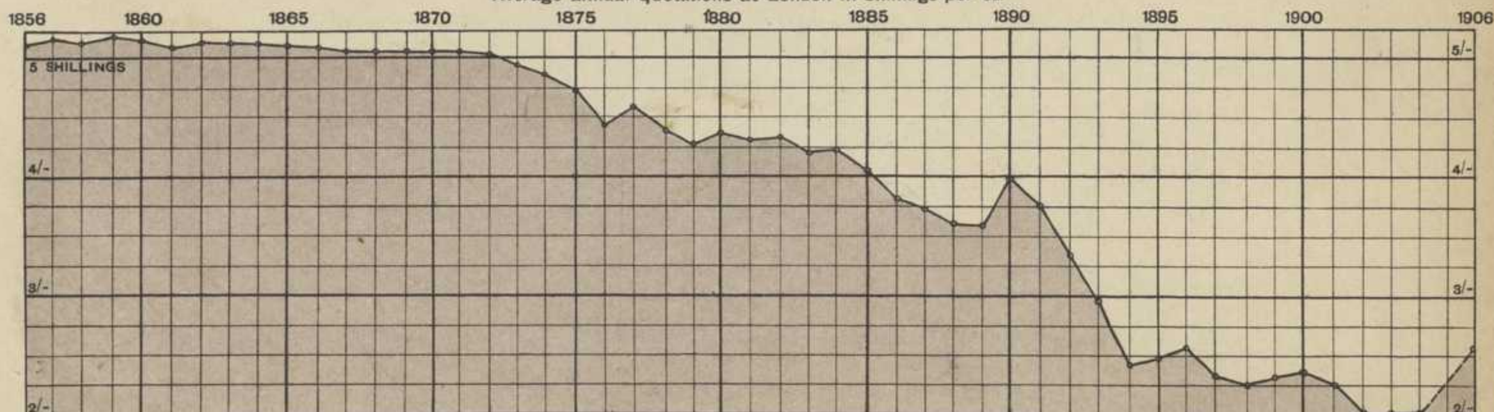




Mexico has now regained the position it held before the extension of silver mining in the United States, of the greatest producer, and, in view of the present great development of its mining industry is likely to hold its own. In the United States the output of silver has fallen during the present century, from 57,647,000 oz. in 1900 to 53,603,000 in 1904.




The large quantity of bullion imported from the United States seems inconsistent with the quantity of fine ounces produced, as shown in the diagram above. This country, however, is a large importer, and much of this bullion was probably mined in Mexico, from which only a very small quantity comes direct.




The discovery of silver in the western states of America began to make a marked effect on the price of silver bullion about the year 1873, at the same time as the introduction in Germany of a new coinage on a gold basis threw a quantity of old silver on the market. Since then the fall has on the whole been constant and rapid till quite recently. The absolutely lowest quotation, in 1902, was 21 11/16d. During 1905 the price steadily rose, and in February 1906 attained a maximum of 30 13/16d. This was a consequence of large demands by the Russians and Japanese, the Indian mint, and the French mint. The Russian and Indian demands have ceased, and an outflow of silver coin from Mexico, where a gold basis has practically been established, tends to lower the price; but it is not anticipated that the low prices of three years ago will return.

# SILVER & LEAD-MINING COUNTRIES



EXPLANATION OF COLOURING

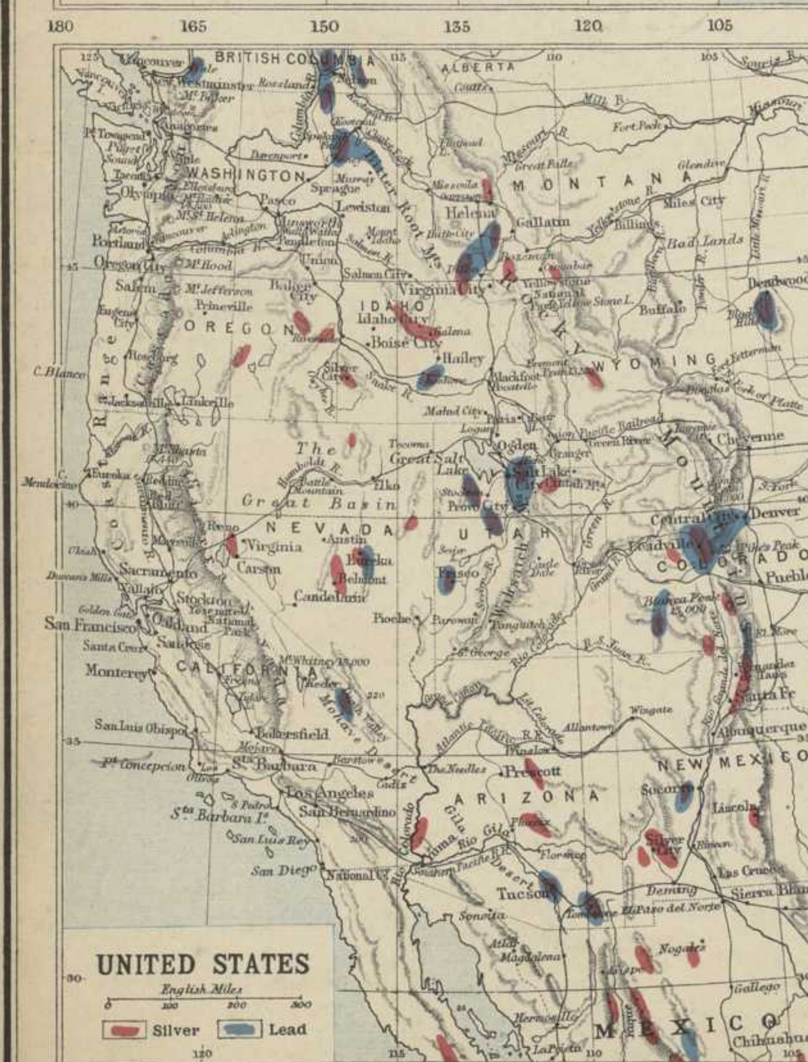
Silver Districts

Lead Districts

Lines of Export














SPAIN

Silver

Lead





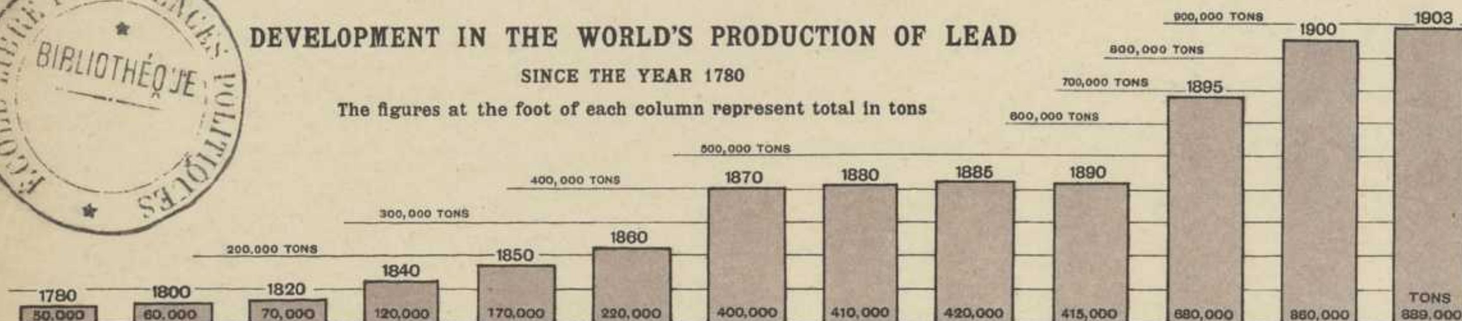


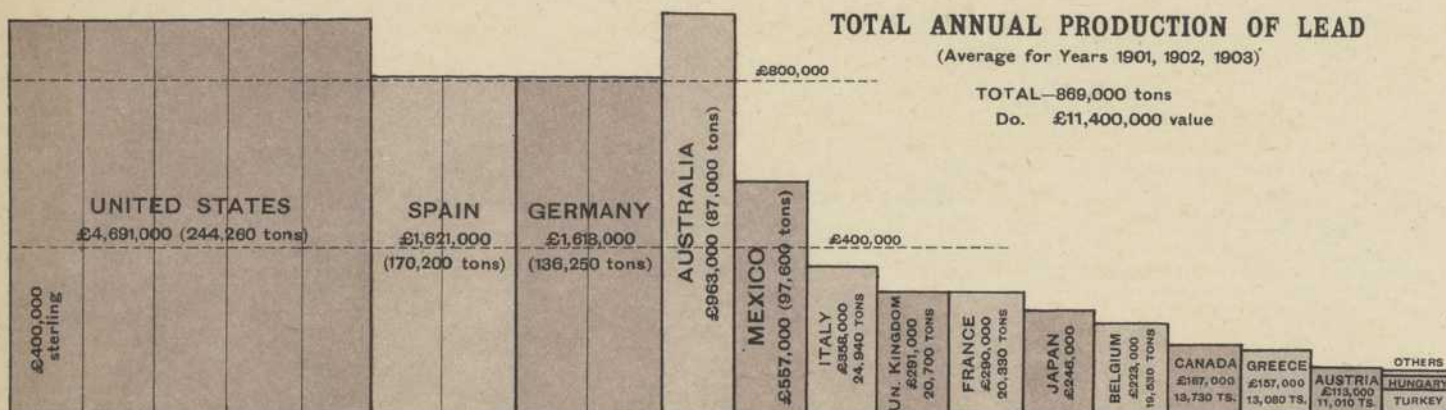
John Bartholomew & Co. Edinr.

# LEAD.

**General Summary.**—A heavy grey metal which rarely occurs pure, and is generally obtained in the form of galena or sulphide of lead, or as cerussite or carbonate, and a small quantity from rarer minerals. All galena is more or less argentiferous and silver is often found with cerussite. The metal is soft, easily malleable, and to a certain extent ductile, and can be readily manufactured into pipes, sheet lead for roofing, gutters and cisterns, bullets and shot. Oxidizing very slowly it suffers less than most metals when exposed to damp in the soil or atmosphere. It enters into the composition of many alloys, such as type metal, pewter, Britannia metal, etc., and having a low metal point, is mixed with tin to form soldering metal. Many of its salts are important in industries. Litharge or plumbic oxide is used in glazing earthenware, and makes oil varnishes dry more quickly and thoroughly. Minium, or red oxide, prepared from a form of litharge known as massicot, is employed as a cement and pigment and in the manufacture of flint glass. Carbonate of lead or white lead is found, as already mentioned, as a mineral, but it is also manufactured from the metal or from litharge for use as a pigment. Sugar, or acetate of lead is applied in medicine and also is mixed with oil varnishes, and chromite of lead is a yellow pigment.



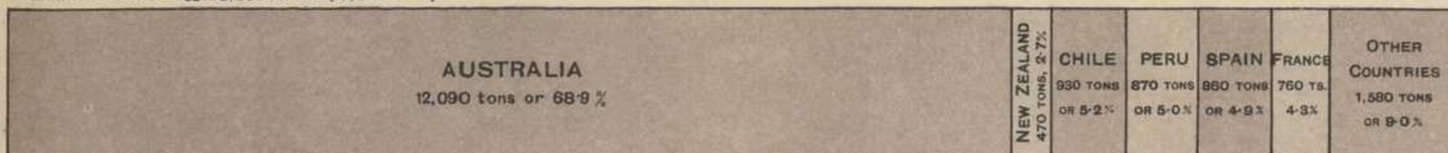


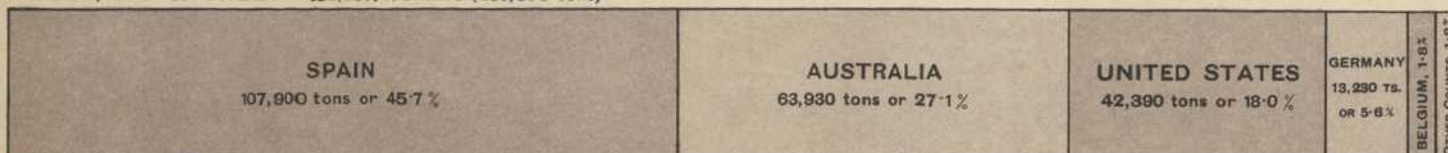

During these years the annual production increased on the whole. The greatest absolute increase was in Germany—more than 2,000 tons, while in Turkey the increase was relatively the largest. The United States output increased by about 10,0000 tons and in 1904 rose to 274,000 tons. The home supply is, however, insufficient for the home industries and lead is imported, chiefly from Mexico. In the United Kingdom the quantity of lead obtained from British ores has for many years been steadily declining.

## SOURCES OF BRITISH SUPPLY OF LEAD ORE; ALSO PIG & SHEET LEAD (Average 1902-4)

LEAD ORE. £128,800 value (17,560 tons)

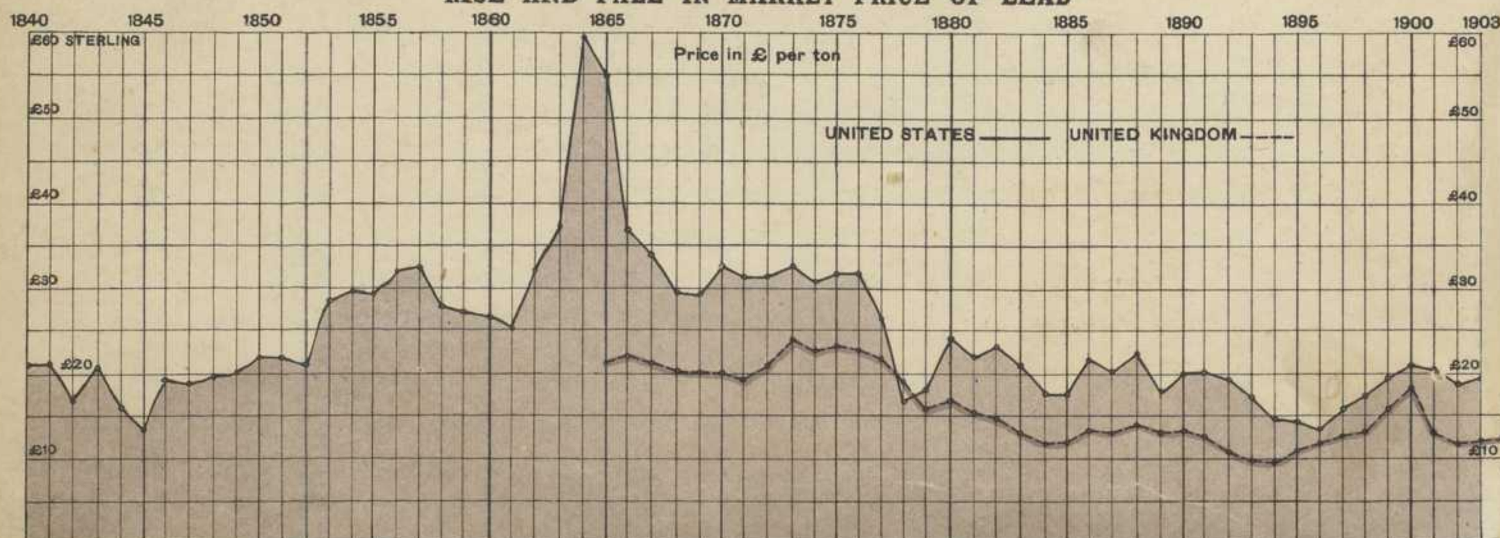



LEAD, PIG & SHEET. £2,697,400 value (235,880 tons)




Though the United Kingdom is no longer one of the chief producing countries, it has a large trade in ore, pig-lead and manufactured goods.

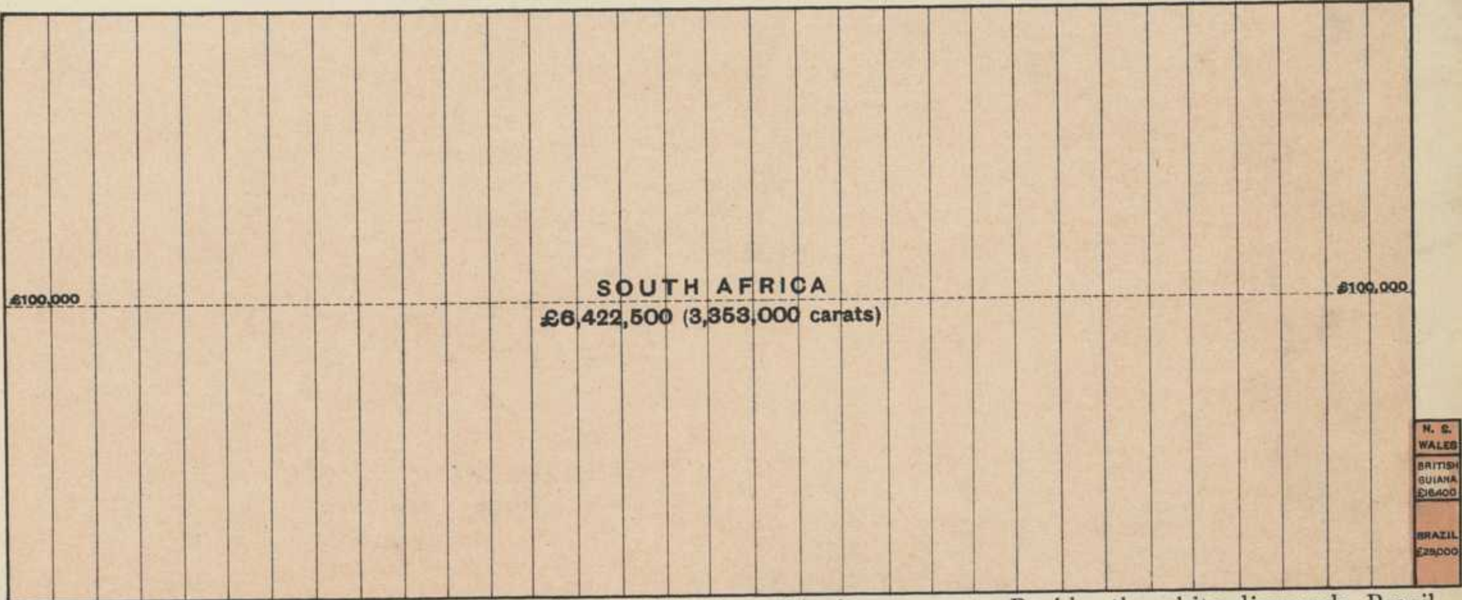
## RISE AND FALL IN MARKET PRICE OF LEAD



# PRECIOUS STONES, PEARLS, &c.

**General Summary.**—The most valuable precious stones—diamonds, emeralds, rubies, sapphires, opals, cat's-eyes, etc., are treated of in the List of Commodities, where also is placed a diagram showing the imports of precious stones into Great Britain. Among these are included a number of less valuable stones, such as moonstones, chalcedony, garnet, topaz, rock crystal, amethyst, etc. Coral is also entered in the List of Commodities, and the produce of the most important fishery, the Italian, is shown below. Mother-of-pearl is a composition consisting chiefly of carbonate of lime which lines the shell of certain molluses When a grain of sand or any other small foreign body gets into the shell the animal covers it with mother-of-pearl, and thus forms a pearl. The chief molluses fished for pearls and mother-of-pearl are the pearl-oyster, *Avicula (Meleagrina) margaritifera*, *A. macroptera*, and *A. Fucata*, the shell of the former two being more valuable than the pearls they contain. River pearls are black and of little value. The mother-of-pearl of Macassar is the best. Imitation pearls are glass bulbs filled with a mixture of liquid ammonia and white matter from fish scales. Roman pearls have a pearly coating outside. Coral is also imitated.

## PRODUCTION OF DIAMONDS IN CHIEF COUNTRIES IN 1904



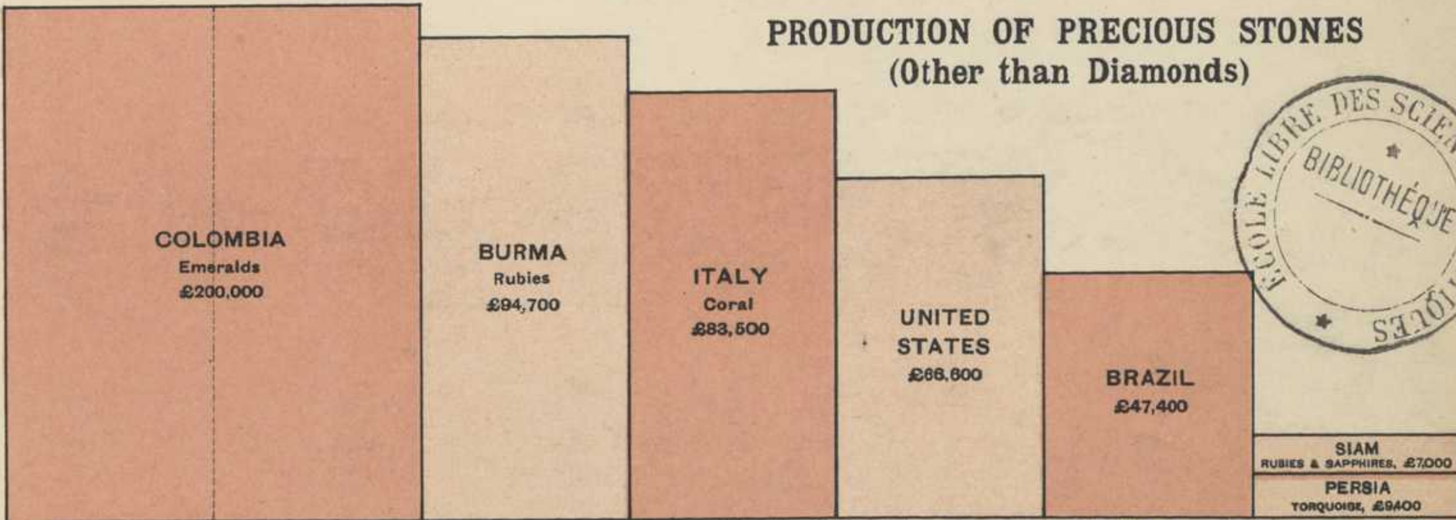

The overwhelming preponderance of South Africa is strikingly apparent. Besides the white diamonds, Brazil exported carbonados to the value of £26,587 in 1904, or less than half the value for 1903. These are not included in the diagram.

## SOURCES OF BRITISH SUPPLY OF DIAMONDS (Average 1903-5)

Total, £5,870,740



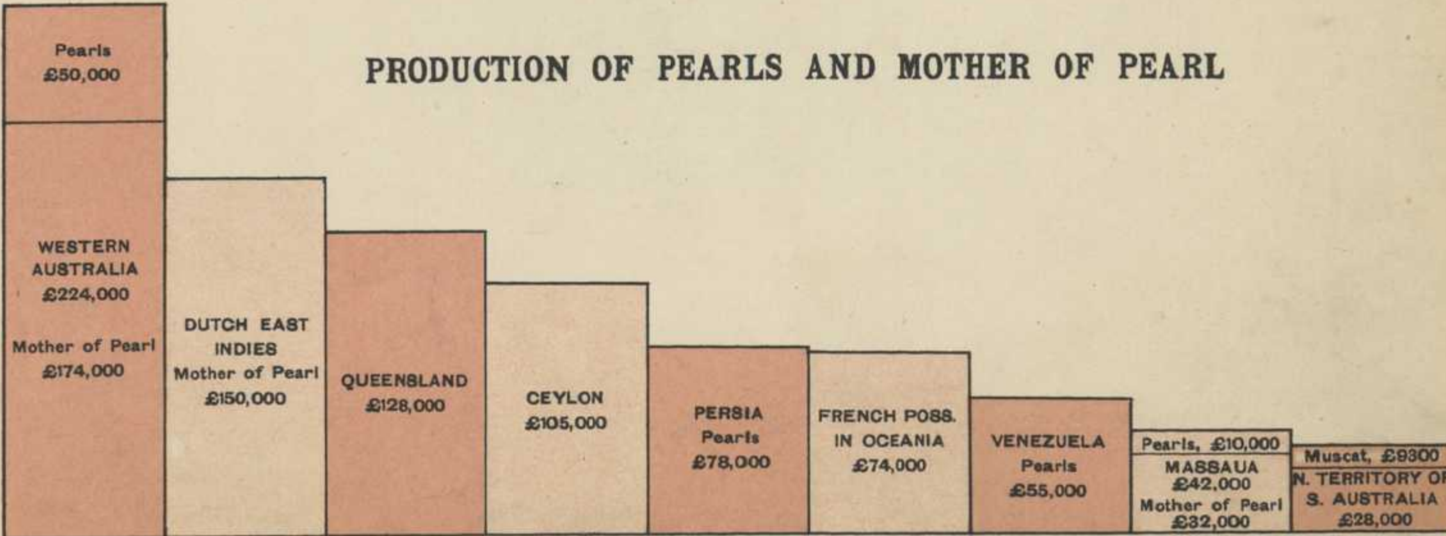

## PRODUCTION OF PRECIOUS STONES (Other than Diamonds)






There are no exact statistics of the output of emeralds in Colombia; the above is the reputed annual value. The yield of Siam is somewhat larger, the value given being that of export from Bangkok, in addition to which many stones are sold at Chantabun of which there are no statistics.

## PRODUCTION OF PEARLS AND MOTHER OF PEARL




It is impossible to give the value of pearls obtained in Queensland and Ceylon; in the latter country the shells are sold with their contents.





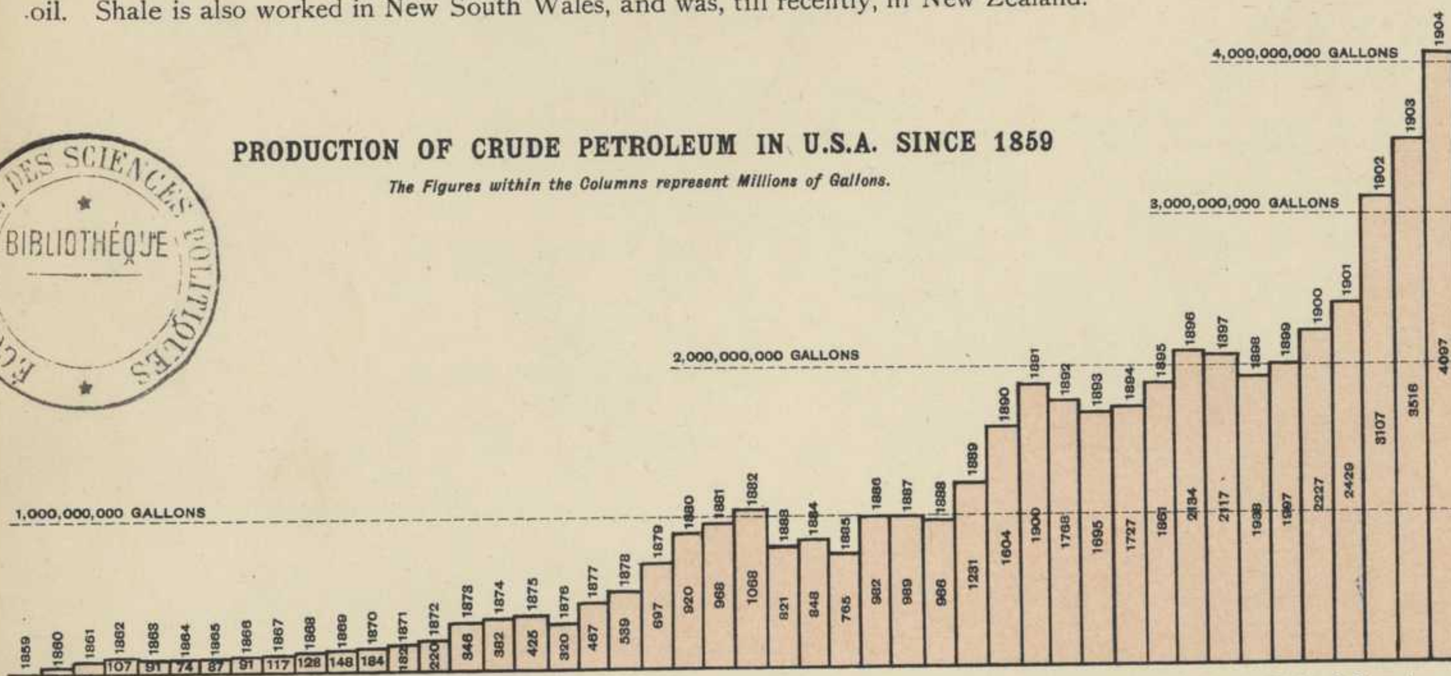


John Bartholomew & Co. Edinr.

# PETROLEUM.

**General Summary.**—Rock oil is obtained by wells sunk sometimes to considerable depths in the earth. It is found in several European countries—Germany, Galicia, and in Rumania, where the output is rapidly increasing and labour is cheap. Burma, where there is a pipe-line to carry the oil from the wells to Rangoon, promises soon to yield sufficient for the demand in India; in Peru the output is increasing, much of the oil being used as fuel without any preparation; the deposits of Trinidad are being opened up and work will probably be commenced in South Africa. Other countries also produce oil, but none in such quantities as the United States and Russia. The best wells are those of Pennsylvania, which yield light oil containing a large proportion of naphthas and refined oils for illumination, while the oils of Texas, Ohio, and California are heavier and yield a larger proportion of lubricating oil. The oil-fields of Baku, on the Caspian Sea also produce heavy oils. At present these two countries, the United States and Russia, produce nearly 90 per cent. (53 and 36 per cent. respectively) of the world's production of crude petroleum, while of refined products the United States produces fully 73 per cent. and Russia 18½. In Great Britain, chiefly in Scotland, about 320,000 barrels of oil and paraffin, and 32,000 tons of sulphate of ammonia are obtained from oil shale. The high value of the paraffin and paraffin wax obtained compensates for the greater amount of labour expended, and the burning oil has the advantage of a higher flash-point than that of the American oil. Shale is also worked in New South Wales, and was, till recently, in New Zealand.




At the present time the largest production is in California, fully 25 per cent. of the whole, Ohio following with 16 per cent. Until 1875, almost all the petroleum was obtained in Pennsylvania and New York, and it was not till 1895 that these states were surpassed by Ohio.

## SOURCES OF BRITISH SUPPLY OF PETROLEUM (Average 1903-5)

Total—ILLUMINATING, 250,429,838 gallons, £4,118,644 value; LUBRICATING, 45,571,533 gallons, £1,400,522 value

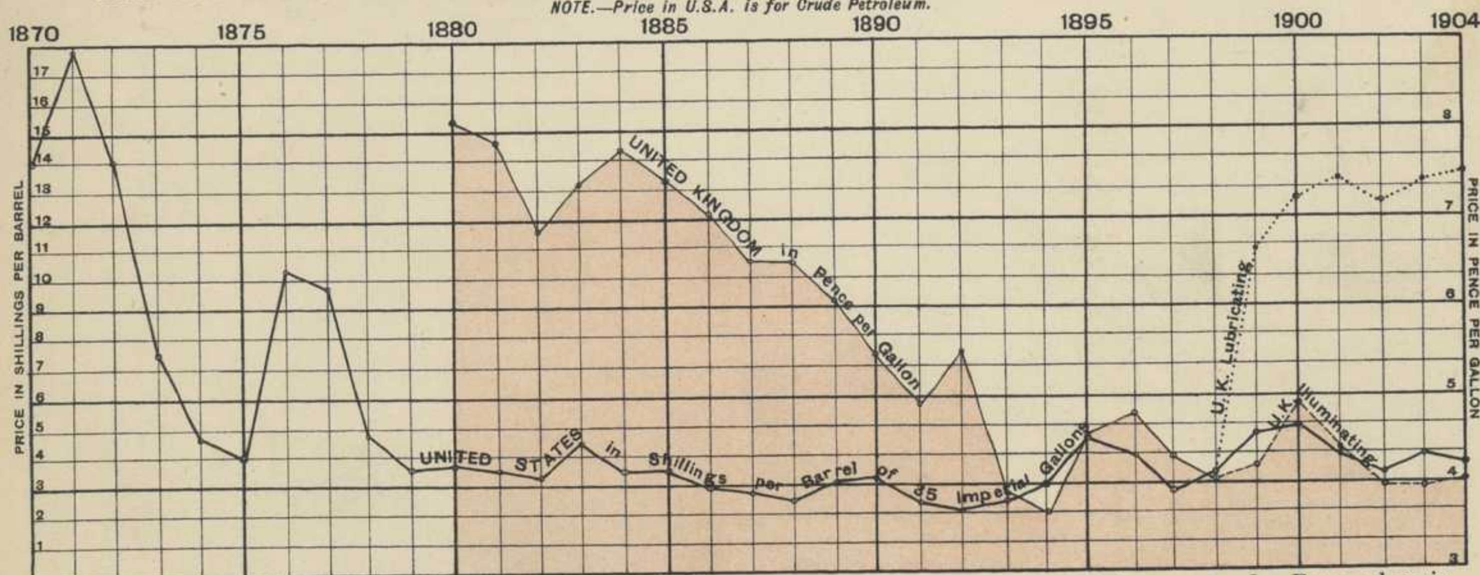
| UNITED STATES | RUSSIA | RUMANIA | HOLLAND & DEPEND. | GERMANY | OTHERS |
|---|---|---|---|---|---|
| 163,741,879 gallons or 55·3 % ILLUMINATING, 132,454,839 gallons | 110,491,445 gallons or 37·3 % ILLUMINATING, 99,577,607 gallons | 8,650,362 GALS. OR 2·9 % | OR 2·1 % | 1·2 % | 1·2 % |

*NOTE.—The Shaded Portions indicate Lubricating Oil.*

The supply from Russia fell off in 1905 in a large ratio, as might be expected, and the loss was made up by much larger imports from the United States, and in a small degree from Holland. The maximum production in Russia was in 1901—2981 million gallons Latterly the industry has been interrupted by civil disorders.

## RISE AND FALL IN MARKET PRICE OF PETROLEUM IN UNITED KINGDOM AND UNITED STATES

*NOTE.—Price in U.S.A. is for Crude Petroleum.*




The price of crude petroleum in the United States is the average for the total output. In Pennsylvania the price in 1904 was 6.73 sh. (in Franklin county 16.44 sh.), while in California it was only 1.14 sh.

## SOURCES OF BRITISH SUPPLY OF ASPHALT (Average 1903-5)

Total, 75,595 tons. £188,949 value

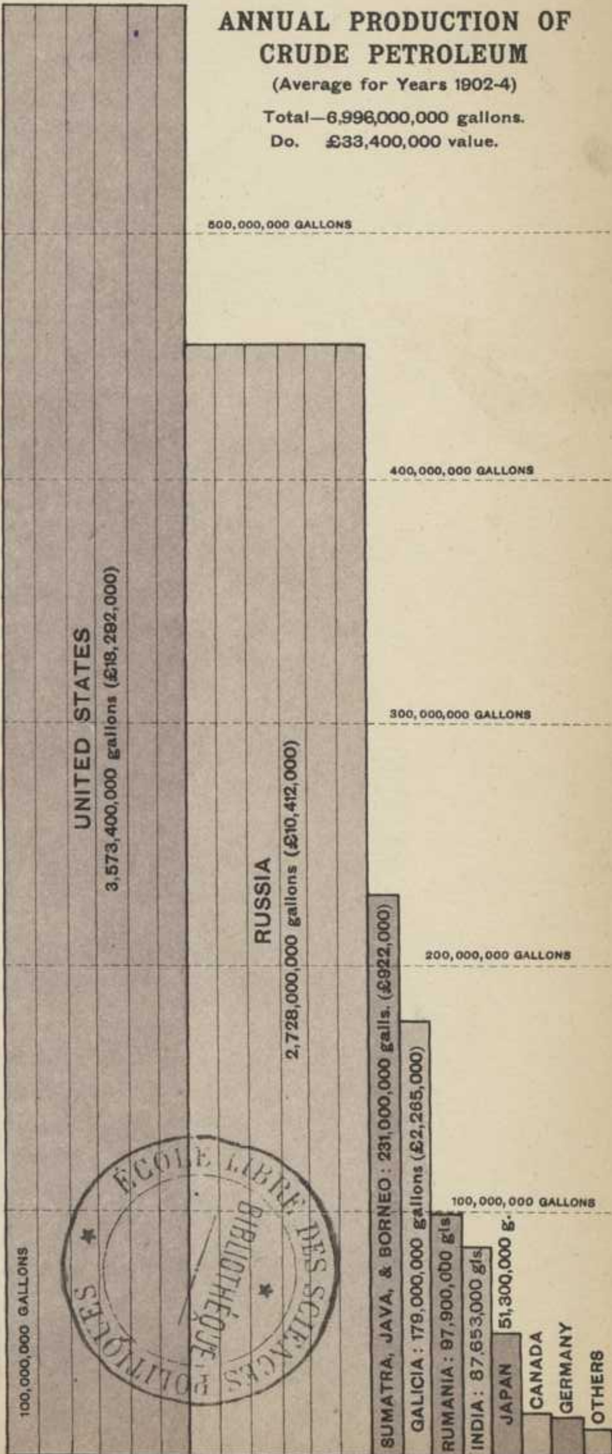
| GERMANY | BRITISH WEST INDIES | FRANCE | ITALY | HOLLAND | U.S.A. | OTHERS |
|---|---|---|---|---|---|---|
| 22,617 tons or 29·9 % | 20,290 tons or 26·8 % | 16,550 tons or 21·9 % | 11,896 tons or 15·8 % | 1998 TONS OR 2·7 % | 881 TONS OR 1·2 % | 1363 T. OR 1·7 % |

# PETROLEUM & ASPHALT.

**EXPLANATION OF COLOURING**

Petroleum • Asphalt +

Lines of Export { Petroleum / Asphalt



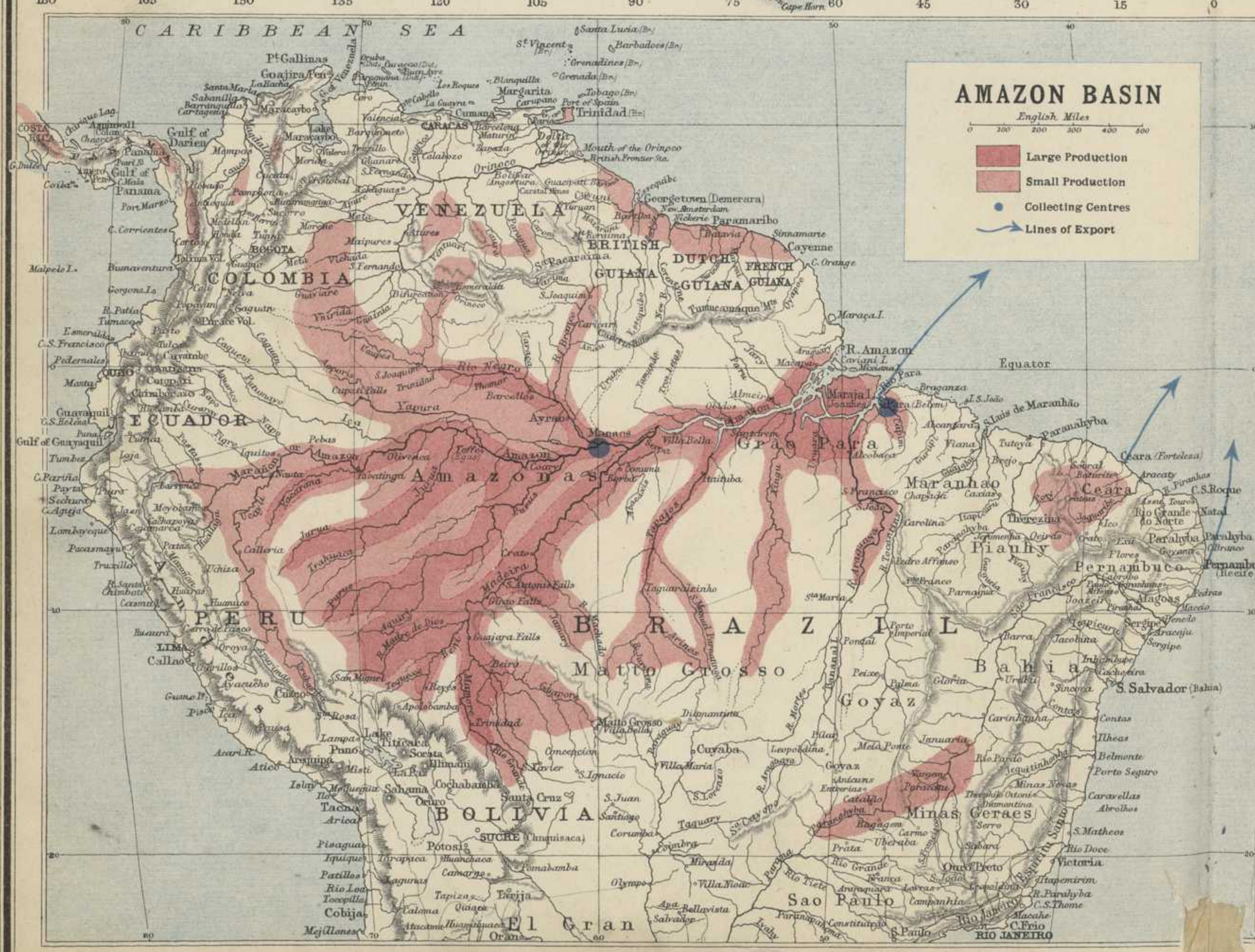


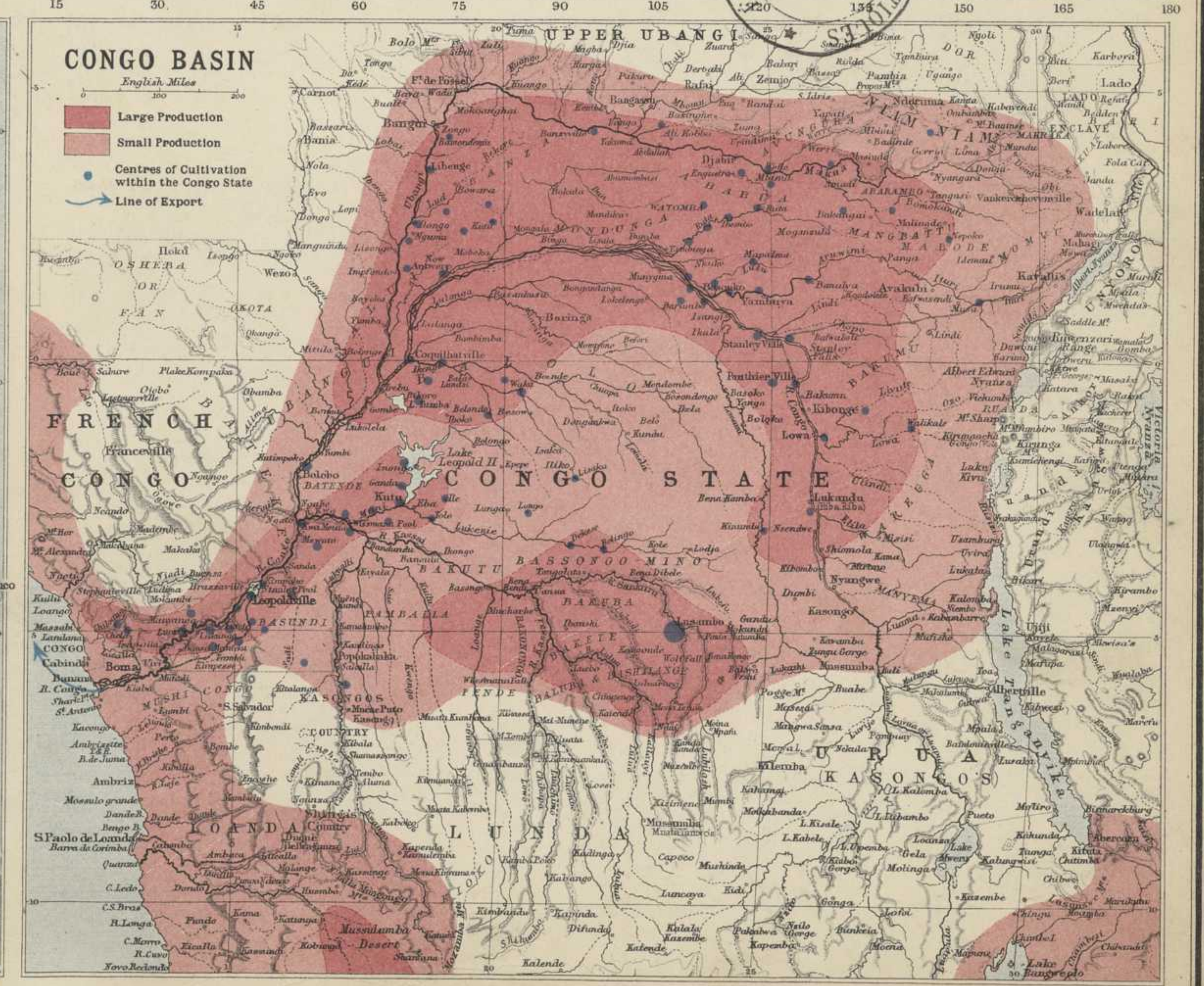

# INDIARUBBER

**EXPLANATION OF COLOURING**

| PRODUCING COUNTRIES | IMPORTING COUNTRIES |
|---|---|
| Large Production | Large Import |
| Small Production | Lines of Export |





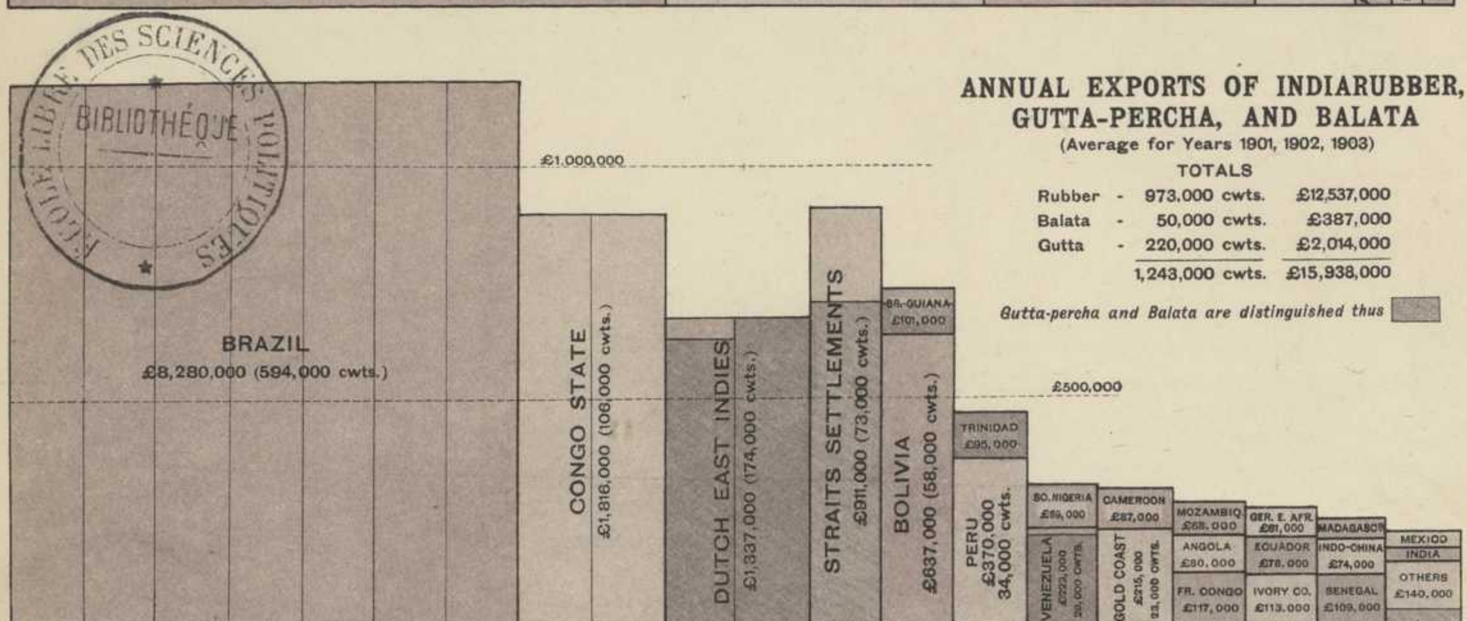



# INDIA-RUBBER.

**General Summary.**—India-rubber, or caoutchouc, is the inspissated sap of trees and plants of several species. The rubber of the Amazons basin is drawn from Heveas, especially *Hevea Brasiliensis*, and another species belonging to the same order, *Manihot Glaziovii*, yields the rubber of Ceará. An Apocynacea, *Hancornia speciosa*, grows from Bahia to Sao Paulo and furnishes Mangobeira rubber, exported chiefly from Pernambuco. A somewhat inferior rubber is obtained from *Castilloa elastica*, which is cultivated in Central America and grows in the north of South America down to the confines of Brazil. Africa has the *Kicksia elastica* and lianas of the genus Landolphia; India the *Ficus elastica*, while other rubber-yielding trees grow in the Eastern Archipelago. The American trees have been introduced into parts of Africa and the East Indies, where the *Hevea Brasiliensis* is most favoured by planters. A tree will give about 8 oz. of rubber in its seventh year and 10 oz. the next year, while trees of 11 to 13 years yield 1½ to 2 lbs. Old trees have been known to yield 13 or 14 lbs. On the Amazons, the latex, or juice, is coagulated by the heat and smoke from a wood fire and moulded into balls. In the plantations the latex is placed in pans and the moisture is pressed out of the cakes of rubber ("biscuits") which collect on the top. A little acetic acid hastens the coagulation. New machines have been introduced which turn out the india-rubber in thin sheets—"crêpe-rubber" or cut it into fine shreds—"worm-rubber." Caoutchouc is made into a large variety of articles—buffers, piping, fire-hose, mats, machine belting, water-proof coverings, cushions, etc., and of late years bicycle tyres and still more recently motor car tyres have absorbed a large quantity. At the same time there has been great destruction of the rubber trees. In the Amazons forests they have been destroyed by over-bleeding, and the collectors have each year to travel into more remote parts. The gutta-percha tree is generally felled, though the sap can be tapped. Cultivation must therefore become of increasing importance. It is estimated that there are now nearly 150,000 acres planted with rubber trees, of which 40,000 are in Ceylon. In this island rubber cultivation has been much extended of late, and the export is increasing and will be many times greater when all the trees are in full bearing. For Gutta-Percha see List of Commodities.

## CONSUMPTION OF INDIARUBBER AND GUTTA-PERCHA IN CHIEF COUNTRIES FOR YEAR 1904

UNITED STATES 520,890 cwts.
GERMANY 251,770 cwts.
UNITED KINGDOM 217,000 cwts.
FRANCE 81,330 cts.
AUSTRIA-HUNGARY 25,990 CWTS.
HOLLAND, 23,970 CWT.
ITALY
BELGIUM



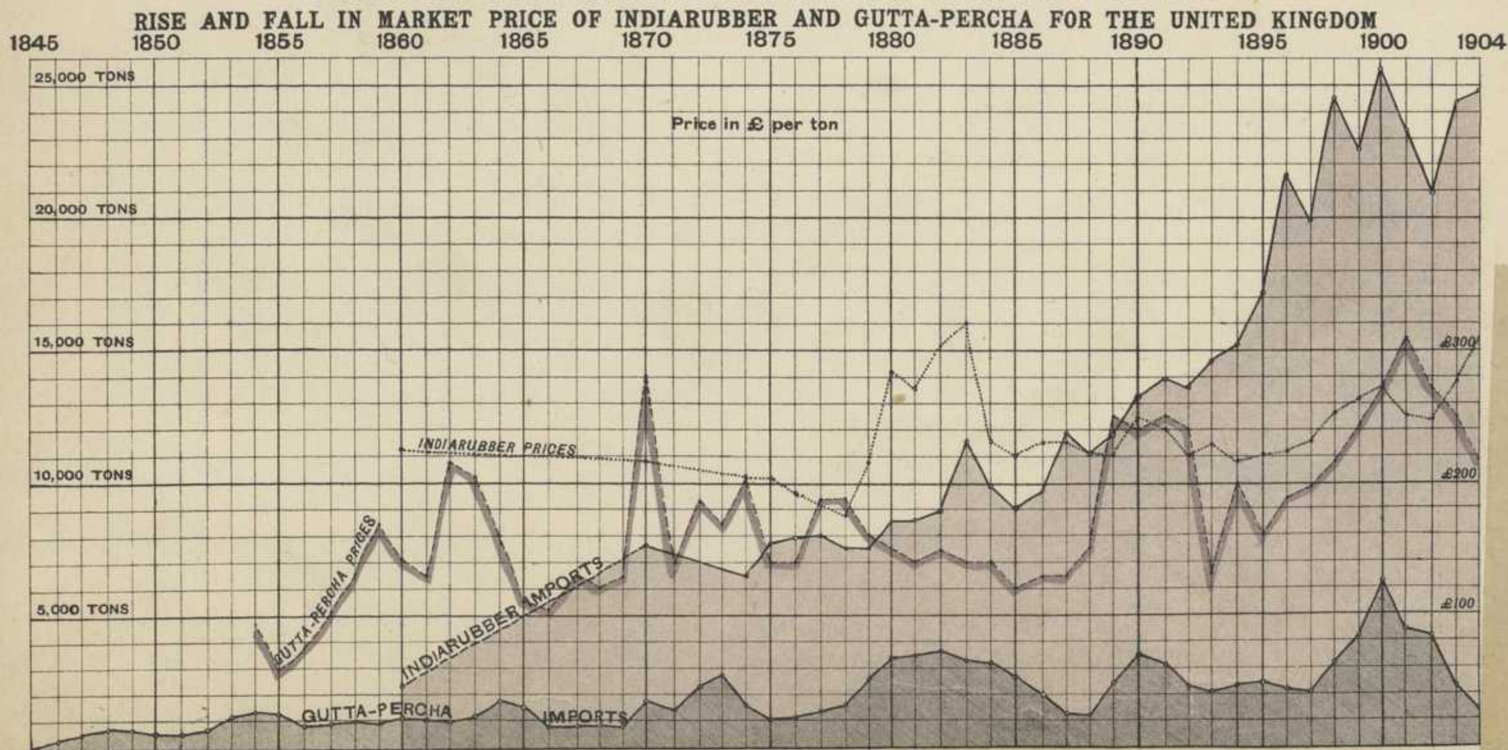


## SOURCES OF BRITISH SUPPLY OF INDIARUBBER (Average 1902-4)

BRAZIL 238,180 cwts. or 51·0 %
AFRICA (FOREIGN) 43,800 CWTS., 9·4%
U.S.A. 26,730 CWTS. OR 5·7 %
RUSSIA 20,770 CWTS., 4·4 %
FRANCE 18,400 CWTS., 3·9 %
PERU 17,090 CWTS., 3·7 %
GERMANY 16,280 CWTS., 3·5 %
BELGIUM 12,140 CWTS., 2·6 %
PORTUGAL 11,030 CWTS., 2·4 %
OTHER FOREIGN COUNTRIES 14,230 CWTS., 3·0 %
BRITISH WEST AFRICA 32,320 CWTS. OR 6·9 %
BRIT. EAST INDIES 12,850 CWTS., 2·8 %
OTHER BRIT. POSSESS.

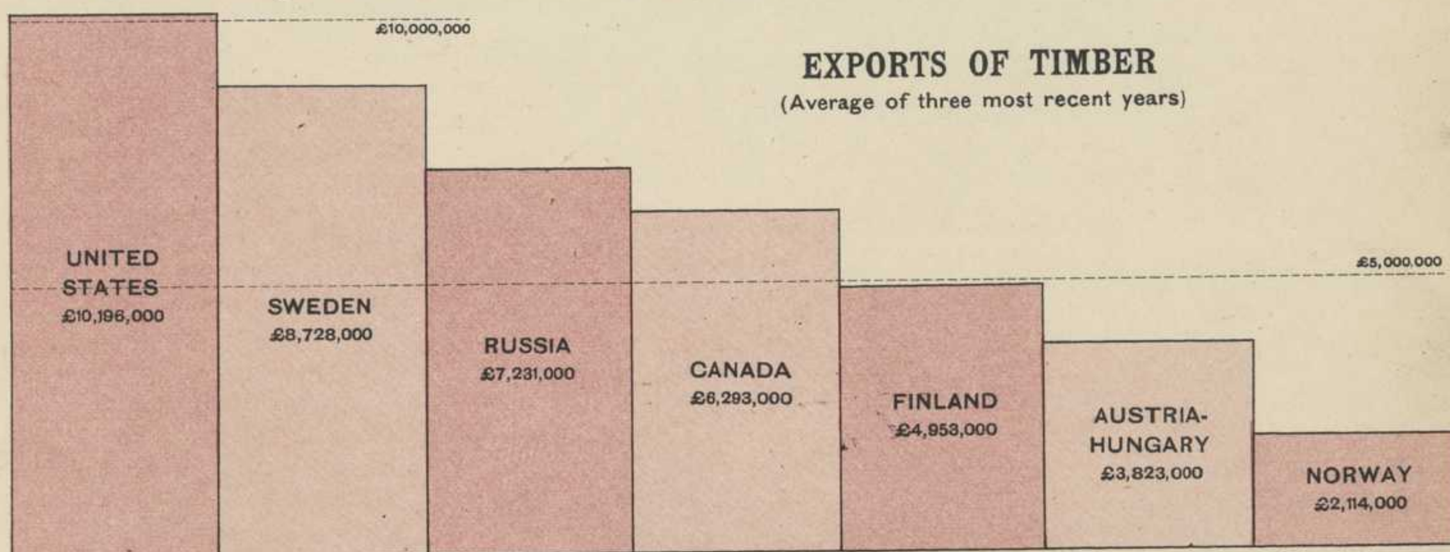
Great Britain is the chief European market for india-rubber. The greater part is landed at Liverpool. The imports into foreign ports are, however, increasing, Hamburg, Antwerp, and Havre receiving larger quantities, and Bordeaux has suddenly sprung up as a rubber-importing port.

## IMPORTS OF INDIARUBBER AND GUTTA-PERCHA SINCE 1845 AND RISE AND FALL IN MARKET PRICE OF INDIARUBBER AND GUTTA-PERCHA FOR THE UNITED KINGDOM

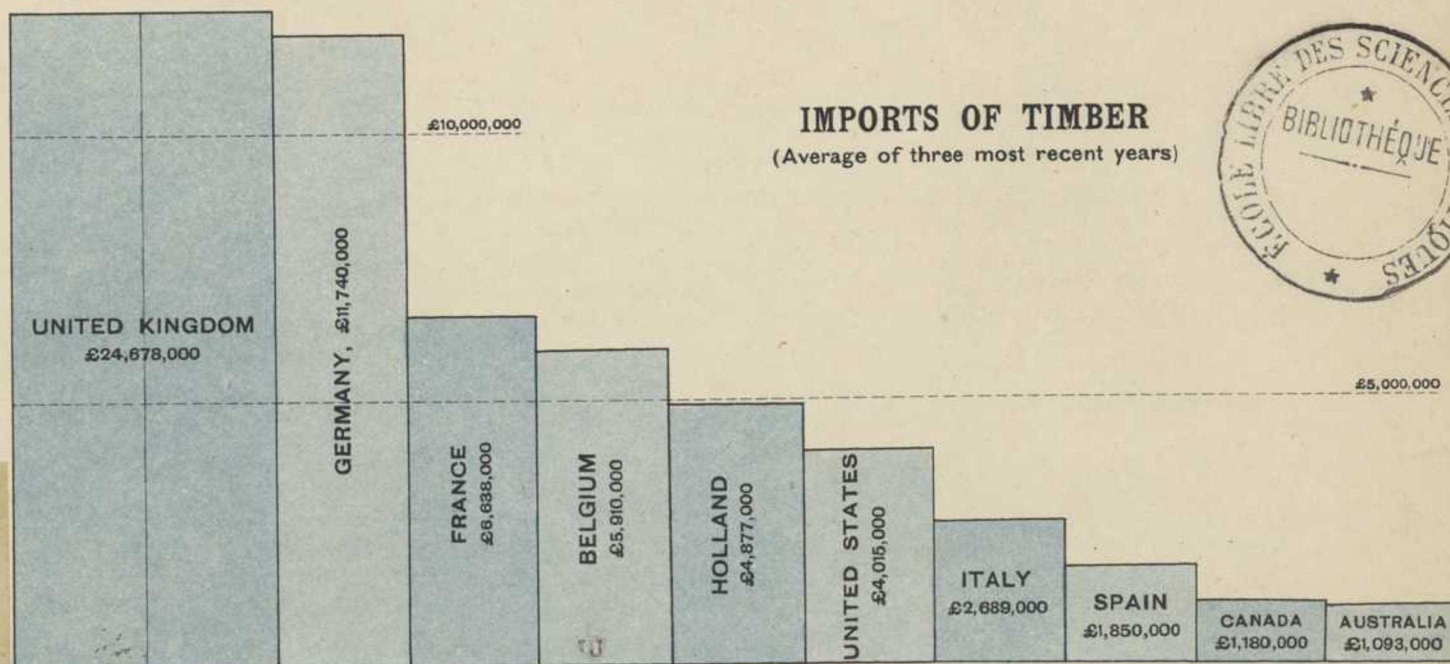


# TIMBER.

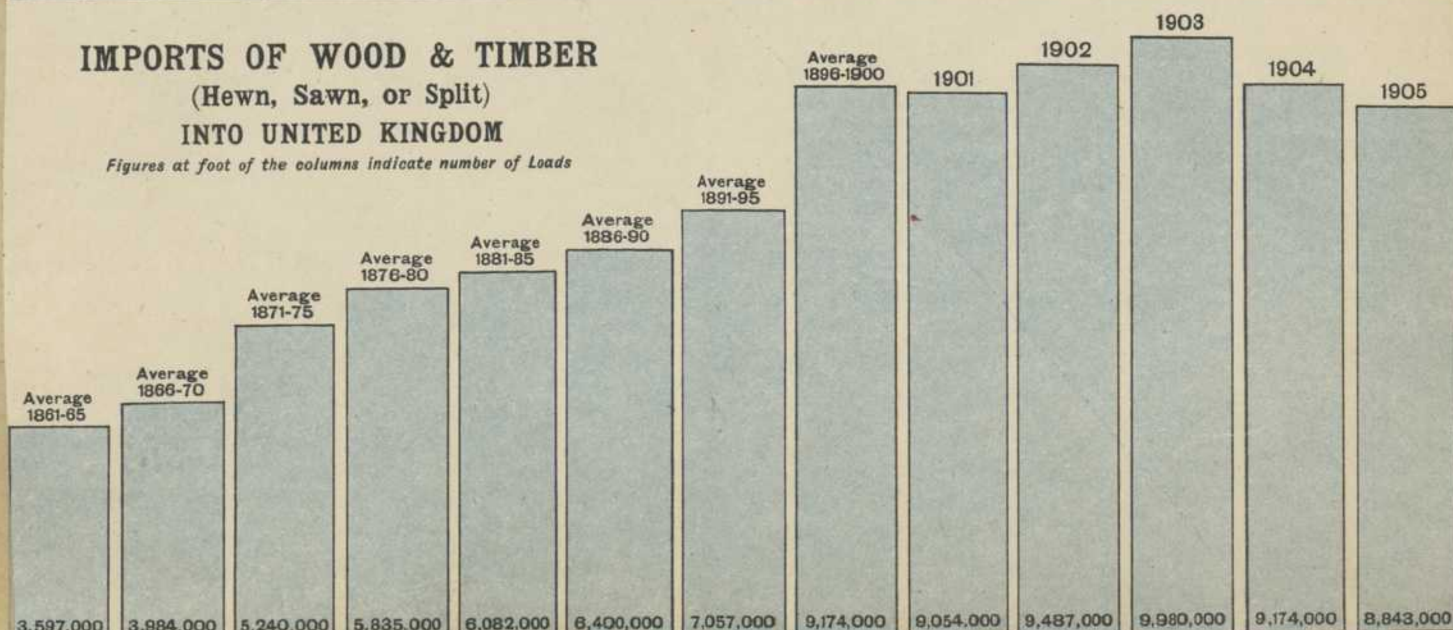
**General Summary.**—The timber most extensively dealt in is that of pines and firs. The best known are the Baltic Redwood from the Scotch fir (*Pinus sylvestris*) and Baltic White Wood (*Abies excelsa*). Canada and the United States have timbers somewhat similar, as the White Pine (*P. strobus*) and Redwood (*P. resinosa*), Californian Redwood (*Sequoia sempervirens*), Oregon pine, and cedars, and spruce. Poplar, oak, ash and beech are harder woods supplied in smaller quantities by several European countries and America. Australia yields many varieties of Eucalyptus, and West Australia exports largely Jarrah (*E. marginata*) and Karri (*E. diversicolor*) for sleepers and paving-blocks. Tropical countries supply, as a rule, cabinet woods, but teak is exported from India, Siam and Java; and Greenheart, very useful in piling, as it resists the action of water and worms, comes from South America, and a variety from the Guinea coast. The most important cabinet wood of temperate climes is walnut, which grows in the southern countries of Europe and in America. Mahogany is exported from the coasts and islands of Central America and from West Africa; rosewood from Brazil and India, and the Kauri pine from New Zealand. Russia, Finland, Austria-Hungary, Norway and Sweden are the chief exporting countries of Europe, having an aggregate area of about 838 thousand square miles of forest, of which 618 are in Russia alone. The other countries of Europe together, have only about 142,000 square miles. Canada and the United States have about 1240 and 780 thousand square miles respectively. Siberia has nearly 2200 thousand square miles hardly touched, and Brazil some two million square miles of tropical forest. During the past century the consumption of wood and timber has rapidly increased, and in most countries it has been found necessary to enforce regulations on the exploitation of forests, which, while in some cases limiting the present supply, will probably lead to increased production. The United States has in the past drawn on a large surplus, the clearance of forests having often been a necessity to make room for agricultural crops, but now it is estimated that the existing forests will with careful management yield annually little more than the present amount of forest products. While, then, no scarcity of timber is expected in the immediate future, the preservation and scientific management of forests are become of great importance.




The quantities shown in the above diagram are those of timber and woods of all kinds. The United States, though exporting much less than one-tenth of its out-put, is first on the list. In Sweden the production is at present practically stationary, partly at least owing to better supervision of the forests. The forests of Canada have suffered seriously from fires, and if these can be prevented, their productiveness would far exceed the present demand made on them. In Sweden, Norway, Canada and the United States, large quantities of wood-pulp are prepared.





# TIMBER-GROWING COUNTRIES

GREENLAND

DOMINION OF CANADA

NORTH AMERICA

UNITED STATES

MEXICO

WEST INDIES

SOUTH AMERICA

BRAZIL

ATLANTIC OCEAN

PACIFIC OCEAN

EUROPE

RUSSIAN EMPIRE

SIBERIA

ASIA

CHINESE EMPIRE

INDIA

SAHARA

AFRICA

INDIAN OCEAN

AUSTRALIA

NEW ZEALAND

EXPLANATION OF COLOURING

Wooded Regions with Timber Trade

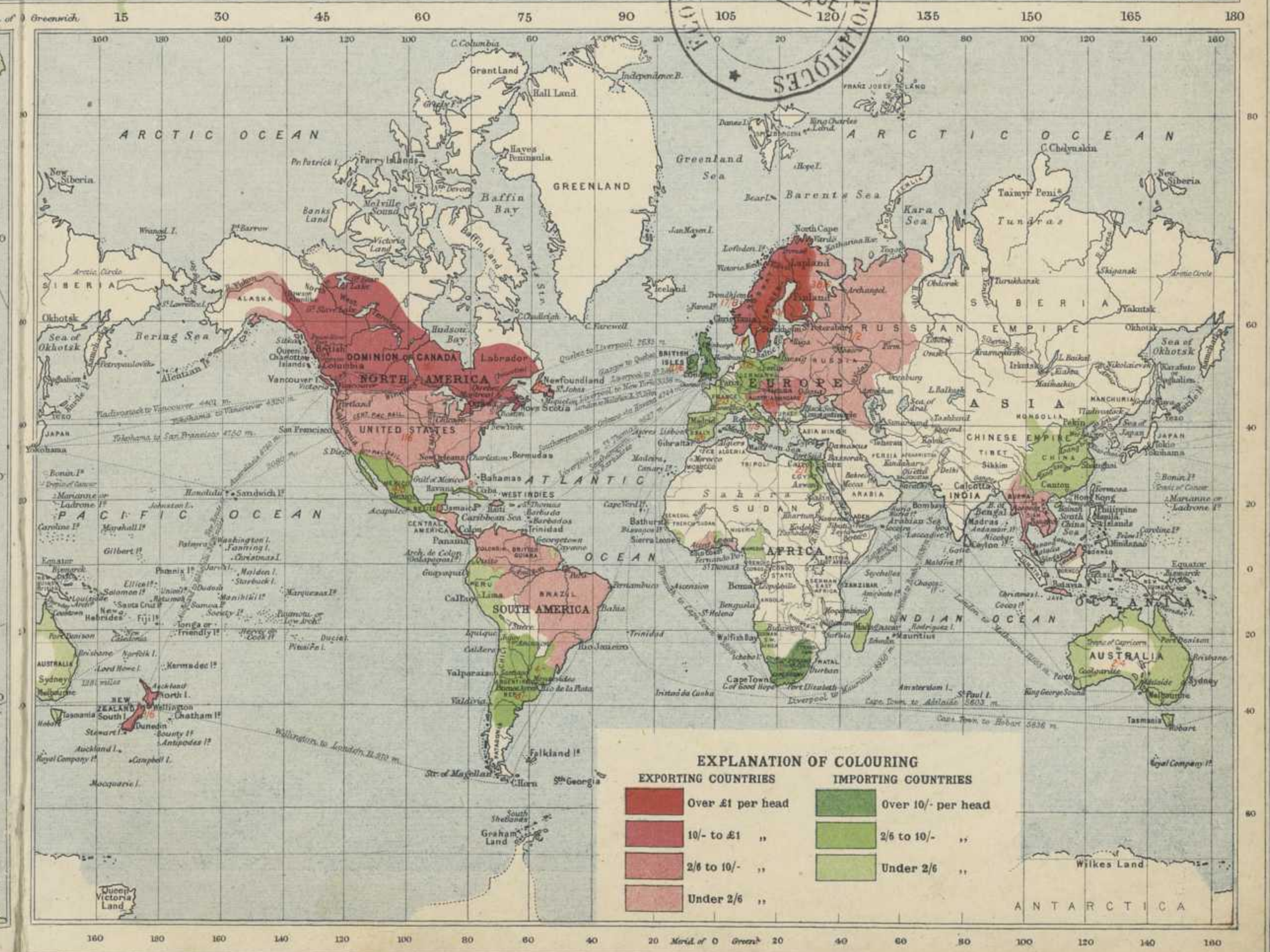
Wooded Regions with no Timber Trade

Names of Chief Timbers of Commerce are located in Red

Lines of Export








John Bartholomew & Co. Edin^r

## UNITED STATES—LUMBER




**VALUE OF PRODUCT PER SQUARE MILE**

- More than £500
- £200 to £500
- £20 to £200
- Less than £20

### IMPORTS OF WOOD & TIMBER (Hewn, Sawn, and Dressed, chiefly Fir) INTO UNITED KINGDOM (Average 1903-5)

Total—9,106,300 Loads; £20,314,600

| | | |
|---|---|---|
| RUSSIA | 2,790,200 loads | or 30·6 % |
| SWEDEN | 2,075,500 loads | or 22·8 % |
| CANADA | 1,366,700 loads | or 15 % |
| NORWAY | 805,400 loads | or 8·9 % |
| FRANCE | 717,300 loads | or 7·9 % |
| UNITED STATES | 644,500 loads | or 7·1 % |
| GERMANY | 264,200 loads | 2·9 % |
| PORTUGAL | 248,700 loads | 2·7 % |
| OTHERS | 193,700 loads | 2·1 % |



### FURNITURE WOODS, SOURCES OF BRITISH SUPPLY (Average 1903-5)

MAHOGANY. 96.420 Tons. Value £836.900. OTHER KINDS. 190.260 Tons. Value £1.168.600

| | | |
|---|---|---|
| UNITED STATES | 95,261 tons | or 33·2 % |
| AUSTRALIA | 68,072 tons | or 23·8 % |
| BRIT. WEST AFRICA | 40,441 tons | or 14·1 % |
| BR. WEST INDIES | 22,388 tons | or 7·8 % |
| CUBA | 10,834 tons | or 3·8 % |
| FR. WEST AFRICA | 10,695 tons | or 3·7 % |
| CANADA | 8,099 tons | or 2·8 % |
| MEXICO | 7,253 tons | or 2·5 % |
| GERMANY | 4,594 TONS | |
| OTHER COUNTRIES | 19,047 TONS | OR 6·7 % |

*Note.—The shaded portion indicates Imports of Mahogany*

### TOTAL IMPORTS OF MAHOGANY LOGS INTO EUROPE DURING 1905

| | |
|---|---|
| AFRICA | 70,692 TONS |
| LAGUNA AND TABASCO COAST | 20,241 TONS |
| CUBA | 17,044 TONS |
| HONDURAS & GUATEMALA | 13,492 TONS |
| NICARAGUA & COSTA RICA | 8,838 TONS |
| S. DOMINGO AND JAMAICA | |
| PANAMA AND COLOMBIA | |

While on the whole there has been an increase of the imports during the past few years, the quantity imported in 1905 was considerably less than in 1904, owing to smaller supplies from Cuba and Africa, and small wood was more abundant.

### TEAK, SOURCES OF BRITISH SUPPLY (Average 1903-5)

Total—56,263 Loads. Value, £764,700

| | | |
|---|---|---|
| INDIA | 40,499 LOADS | OR 72·0 % |
| SIAM | 7,515 LOADS | OR 13·3 % |
| JAVA | 5,547 LOADS | OR 9·9 % |
| HOLLAND | 1,235 LOADS | OR 2·2 % |
| STRAITS SETTLEMENTS | 1,020 LOADS | OR 1·8 % |
| OTHER COUNTRIES | | |

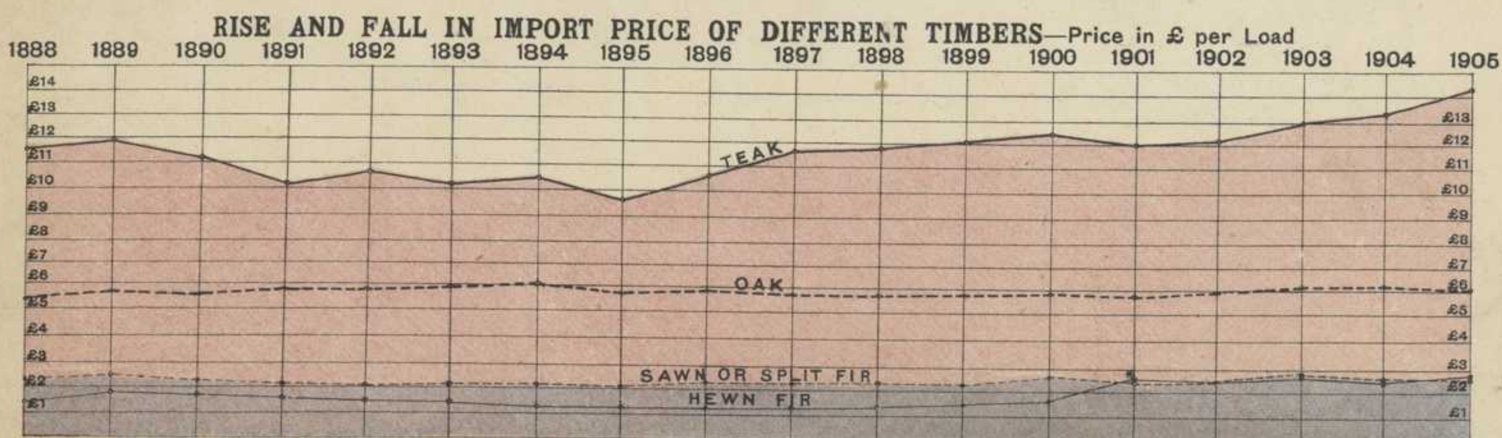
The imports in 1905 were somewhat greater than in the preceding year when the supply was unusually small, and the prices were very high. The exports from Burma and Siam together in 1904 were about the same as 15 years ago, but those from the former country have considerably diminished and the state of the timber trade in Burma is viewed with alarm. Java wood is improving in quality and has had an increased sale.

### OAK, SOURCES OF BRITISH SUPPLY (Average 1903-5)

Total—169,578 Loads. Value £1,042,980

| | | |
|---|---|---|
| UNITED STATES | 116,704 loads | or 68·8 % |
| GERMANY | 19,407 loads | or 11·4 % |
| RUSSIA | 14,940 loads | or 8·8 % |
| CANADA | 9,056 loads | or 5·4 % |
| AUSTRIA-HUNGARY | 8,062 LOADS | OR 4·8 % |
| OTHERS | 1,409 LOADS | OR 0·8 % |

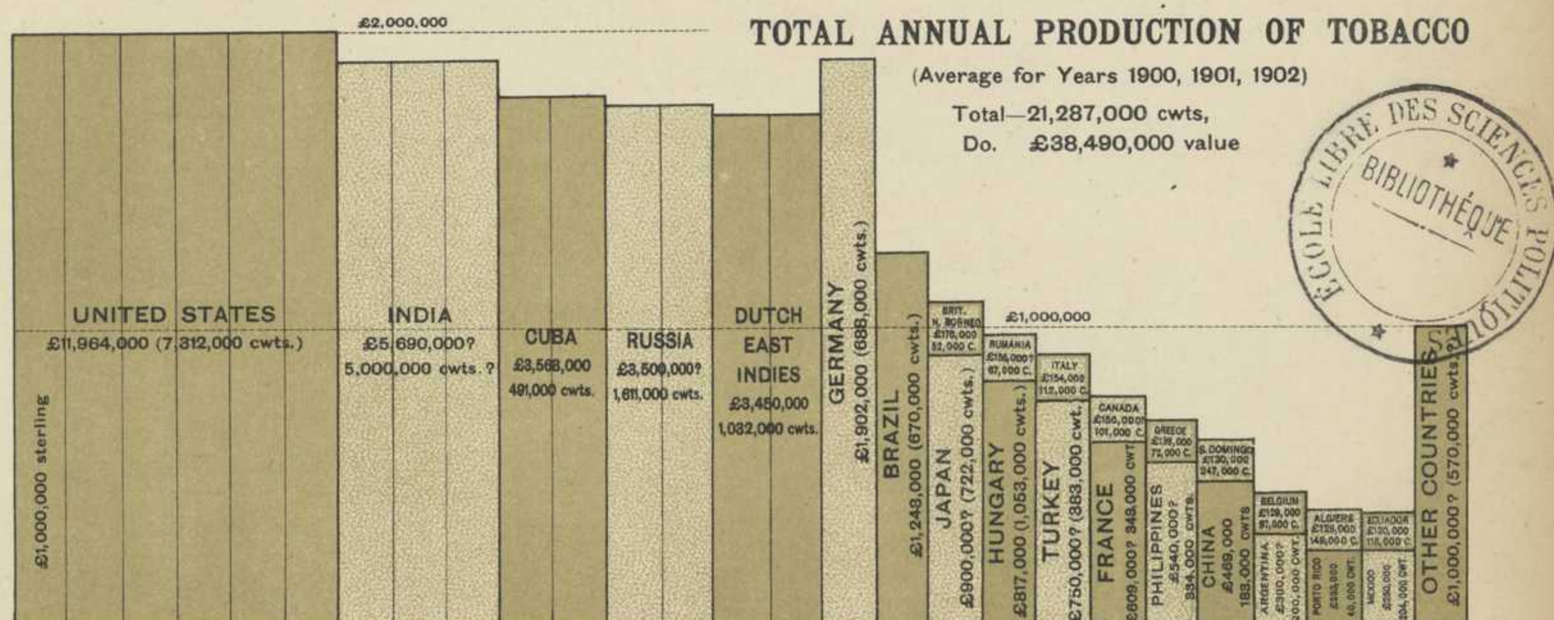
### RISE AND FALL IN IMPORT PRICE OF DIFFERENT TIMBERS—Price in £ per Load



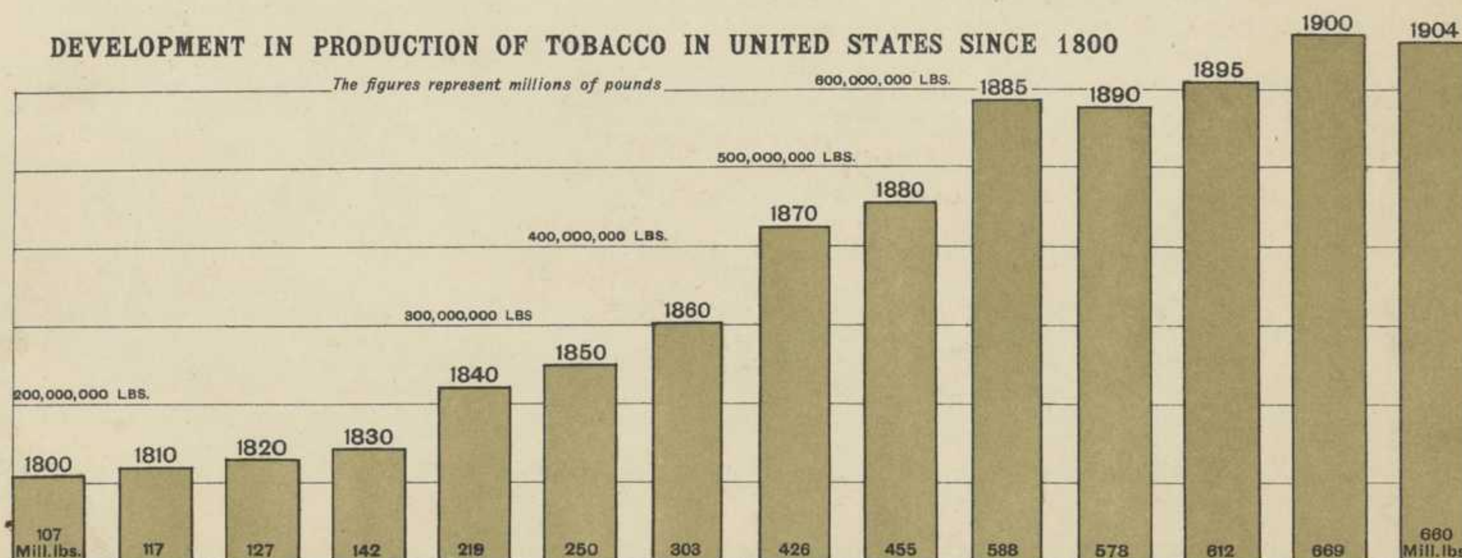

* *Pit Wood and Pit Props are not included from 1901*

# TOBACCO

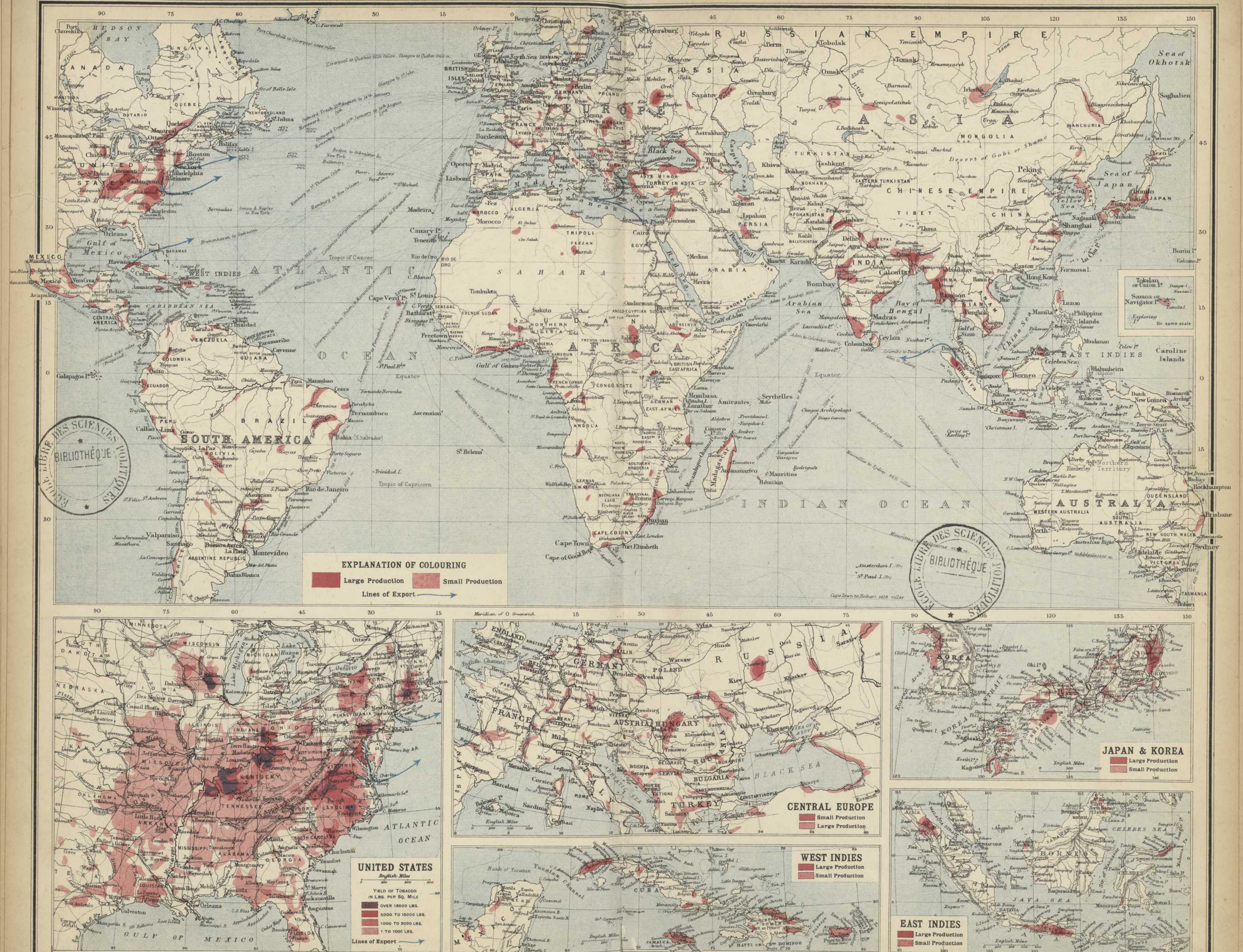
**General Summary.**—The tobacco plant is of the Solanaceæ order. There are numerous species, commercial importance being *Nicotiana Tabacum*, from which are obtained most of the tobaccos of the United . . . and the West Indies ; *N. rustica*, cultivated chiefly in Asia Minor, Africa, and some parts of India ; and *N. Persica*, which yields the mild tobacco of Shiraz. Though cultivated at Nizhni-Novgorod and in the south of Sweden, the plant is rarely found north of lat. 55°, and produces the best-flavoured leaves within 30° or 40° of the equator. Its flavour also depends greatly on the soil. A warm moist climate and a well-drained sandy loam, without much organic matter, are most suitable. Nowhere are more favourable conditions for its growth to be found than on the southern slopes of the Sierra de los Organos, in the Vuelta Abajo, the western extremity of Cuba. Mexican tobacco is, perhaps, next in quality, and good leaf is also produced in the United States, West Indies, and the east coast of Sumatra. Manila is noted for its cheroots and Asia Minor for cigarette tobacco. It is very important that the leaf should be dried properly, after which it undergoes fermentation and develops much of its peculiar flavour. Some kinds of leaf are especially suited for wrappers, as, for instance, the Sumatra, which has been introduced into Florida, while other kinds, and the imperfect leaves, are used for filling cigars and for cut tobacco. Cigars should be made from the fresh leaf, and therefore can be made of good quality only where the tobacco is grown. Most imported leaves are manufactured into pipe tobacco. For the lighter kinds the leaves are damped and pressed, and the dark-coloured liquid which runs off, called " sauce," is mixed in with the strongest kind of leaf to form cake or twist tobaccos, such as Cavendish, Negrohead, Pigtail, &c., which are oiled with sweet oil. In America, chewing and smoking tobaccos are often flavoured with molasses or licorice. For cigarettes, largely manufactured in the United States and Egypt, tobacco of a very light shade is chosen, which shade depends on the variety of the plant, the soil, and the method of curing. Tobacco is a native of America, where it was used, on the arrival of the Spaniards, from Canada to Patagonia. Its name is sometimes said to have been derived from the island Tobago, but more probably is that of the forked reed through which the natives inhaled the smoke through their nostrils. Tobacco was taken to Spain and Portugal in 1559 by Hernandez de Toledo from San Domingo, was introduced into England from Virginia by Sir Francis Drake in 1585, and in the following century the habit of smoking spread over Central Europe, and as far east as Constantinople. Now it is known everywhere except among a few remote savages, and few articles are more widely distributed. Tobacco was first cultivated by a European at Jamestown in Virginia in 1612, and during the eighteenth century Virginia and Maryland were the chief producers. At the present time Kentucky produces more than a third of the tobacco grown in the United States. This country is also the largest manufacturer of tobacco, importing considerable quantities of leaf as well as working up a large proportion of its own crop. Cigar manufactories were established in Connecticut in 1810, and are now to be found everywhere, especially in Pennsylvannia and New York. In most European countries the cultivation of tobacco is under government control, and the manufacture is carried on in government factories, as in France, Italy, and Turkey. In the United Kingdom the cultivation was prohibited by law until 1886, when experiments were permitted under certain restrictions, and also in Egypt. Tobacco is now grown in several colonies in Africa. British Central Africa exports leaf—some 2000 acres have been planted in Rhodesia, and cultivation has been commenced in Uganda.





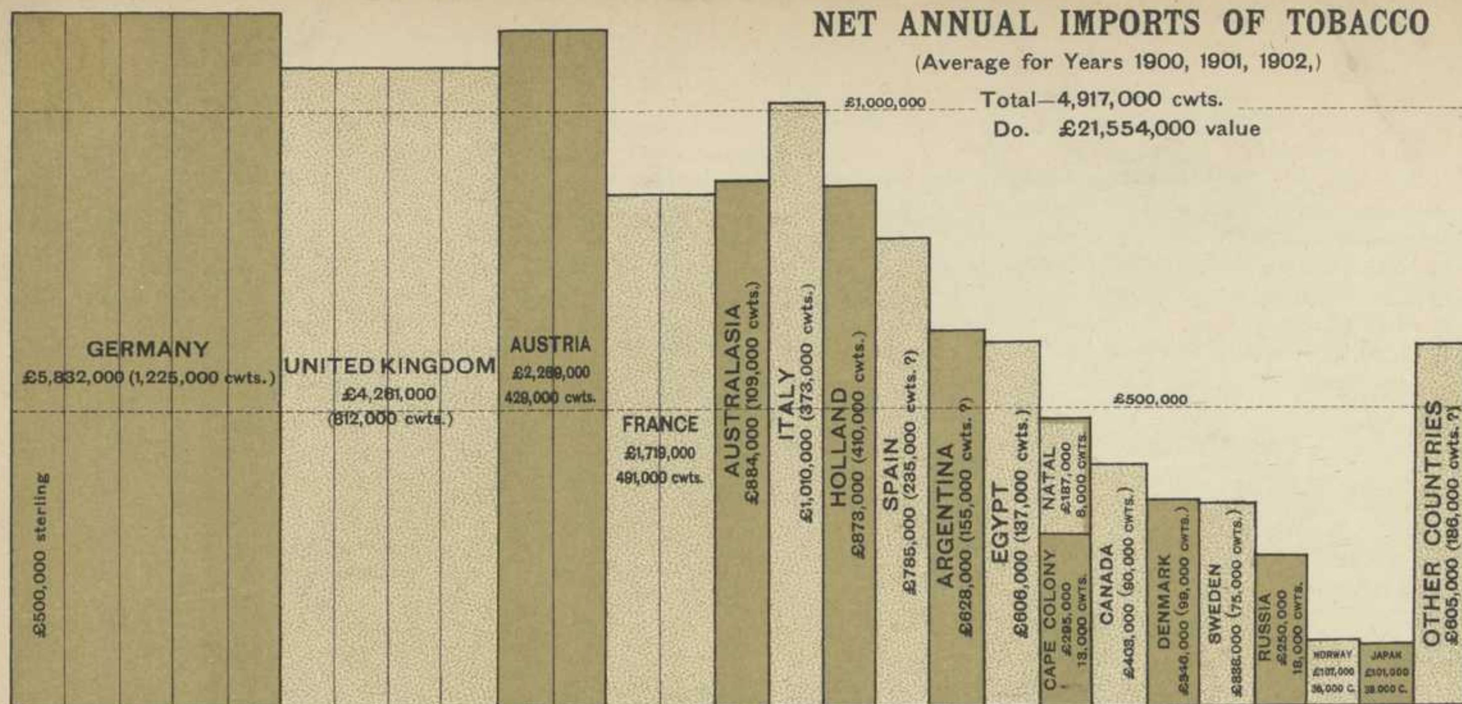




A great discrepancy is at once apparent between the quantities given in this and the preceding diagram. The reason is that in the latter the quantity is given as returned by the growers, whereas the quantities in the Growth of Production diagram are those received in the factories. After leaving the farmers' hands the tobacco is sweated by the leaf dealers, with a consequent loss of weight amounting to 15 to 20 per cent. Stemming tobacco shipped to Great Britain accounts for 3½ per cent., and small quantities are consumed by the farmers or are sold to their neighbours.


EXPLANATION OF COLOURING
Large Production
Small Production
Lines of Export
UNITED STATES
English Miles
YIELD OF TOBACCO IN LBS. PER SQ. MILE
OVER 15000 LBS.
5000 TO 15000 LBS.
1000 TO 5000 LBS.
1 TO 1000 LBS.
Lines of Export
CENTRAL EUROPE
Small Production
Large Production
WEST INDIES
Large Production
Small Production
JAPAN & KOREA
Large Production
Small Production
EAST INDIES
Large Production
Small Production
ATLANTIC OCEAN
INDIAN OCEAN
SOUTH AMERICA
AFRICA
ASIA
EUROPE
AUSTRALIA
RUSSIAN EMPIRE
CHINESE EMPIRE
GULF OF MEXICO
BLACK SEA
ÉCOLE LIBRE DES SCIENCES POLITIQUES BIBLIOTHÈQUE
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## NET ANNUAL IMPORTS OF TOBACCO

(Average for Years 1900, 1901, 1902,)

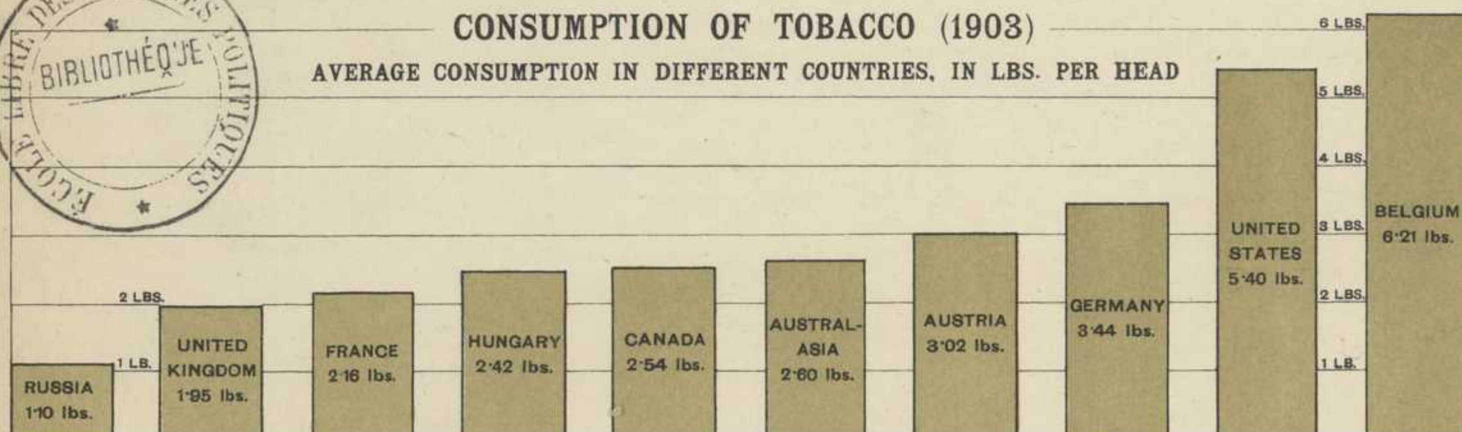



The balance in the United States being on the side of the exports, that country does not appear in the above diagram. It imports, however, tobacco leaf and cigars to the value of about 4 millions sterling.



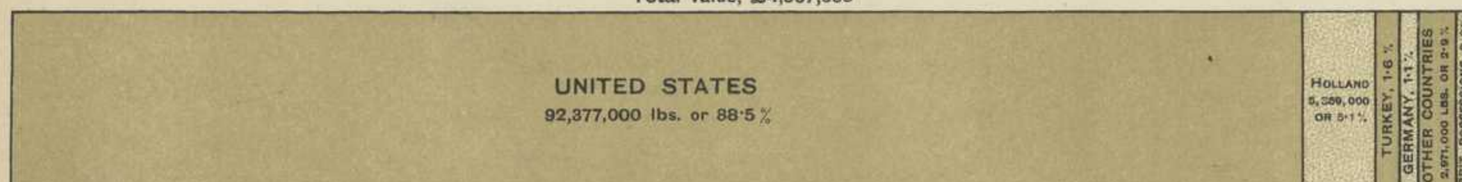
## CONSUMPTION OF TOBACCO (1903)

AVERAGE CONSUMPTION IN DIFFERENT COUNTRIES, IN LBS. PER HEAD



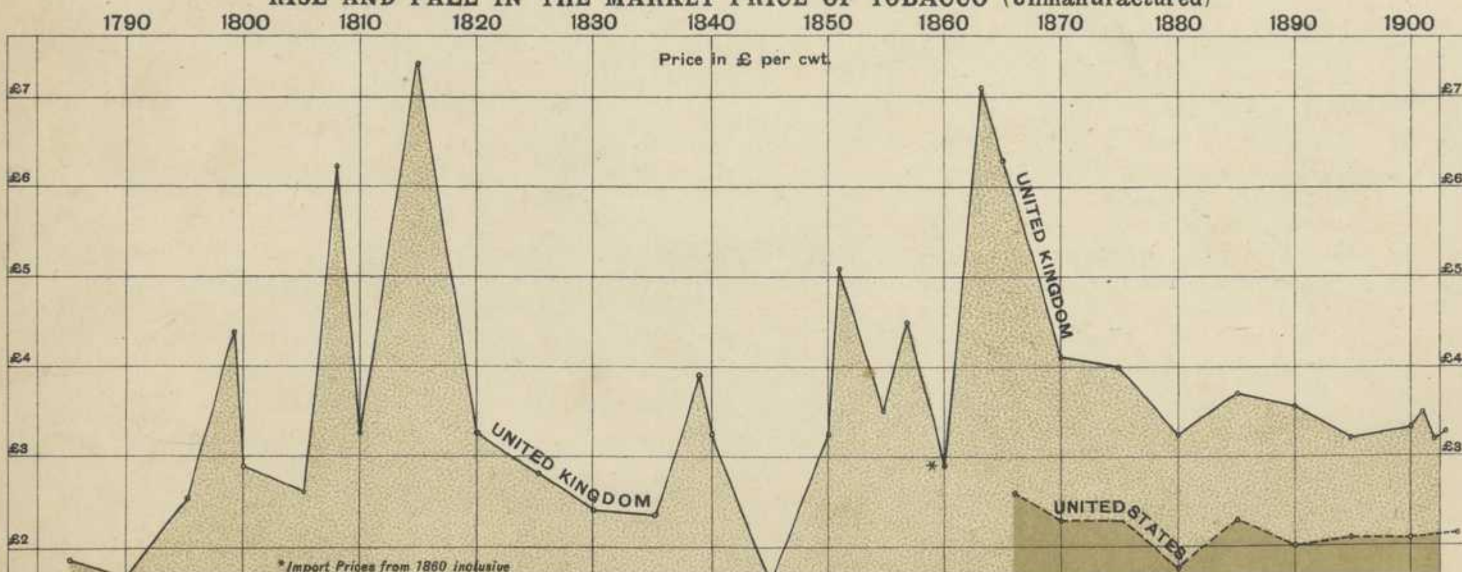

## SOURCES OF BRITISH SUPPLY OF TOBACCO (Average, 1901-3)

Total Value, £4,957,000




The gross imports of tobacco into the United Kingdom, now amounting to about 104 million lbs., have more than doubled during the past 15 years, and the proportion contributed by the United States has increased by about 9 per cent. The tobacco of America is superior on an average to that of the East Indies, and a great deal of the tobacco of the West Indies passes through the United States, especially that of Cuba and Porto Rico. Holland shows a relatively high percentage owing to the tobacco grown in East Sumatra.

## RISE AND FALL IN THE MARKET PRICE OF TOBACCO (Unmanufactured)




Tobacco is a variable crop and hence the great fluctuations in the price. The maximum occur during the Napoleonic wars and the American civil war. The distance of the United Kingdom from the principal sources of supply, and the high duty which excludes the inferior qualities, are no doubt the causes of the considerably higher prices in the United Kingdom compared to those in the United States.

# IVORY, GUMS, RESIN & WAX.

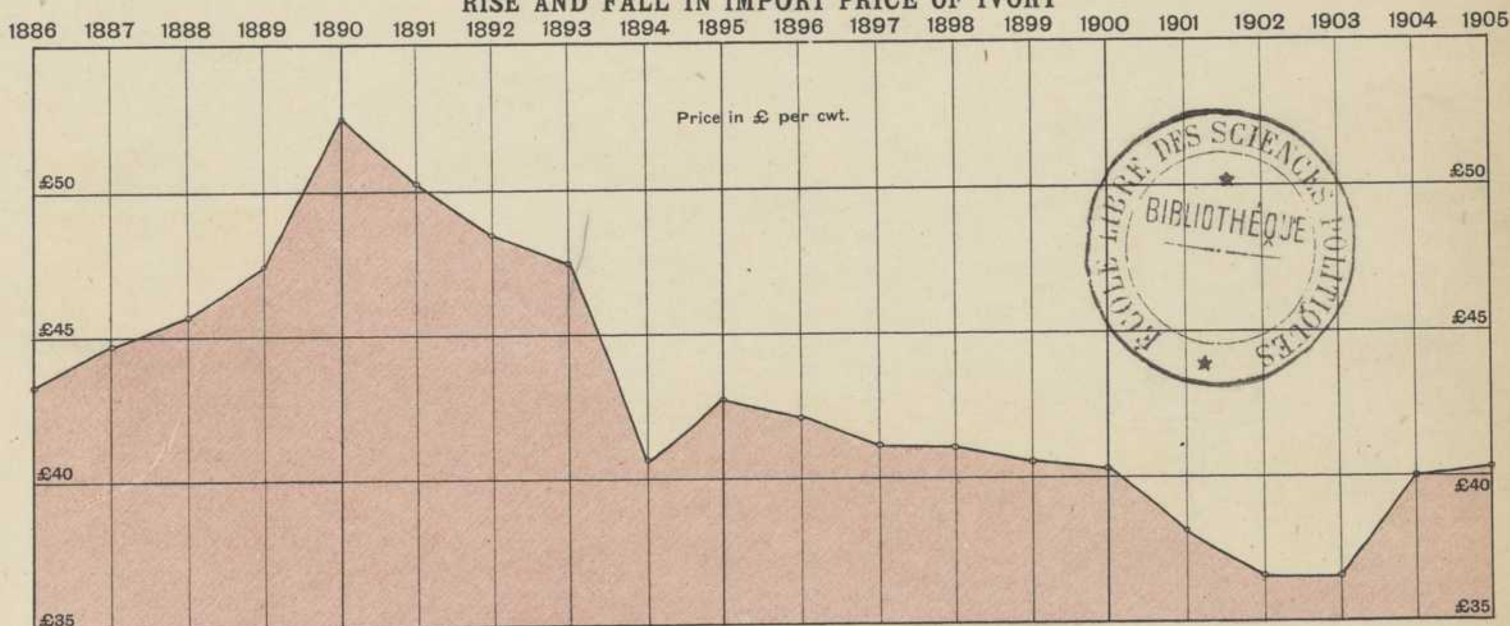
**IVORY.**—Ivory is the dentine of the teeth of several different animals. The best and most plentiful is derived from elephants' tusks, especially the tusks of the African elephant. Little is obtained in Southern Asia, and that is manufactured in the East. The exports of India are derived from imports from the African continent. The tusks seldom exceed 180 lbs. in weight; those under 20 lbs. are called *scrivelloes.* Hippopotamus teeth yield good ivory which does not lose its colour, but, being hollow for a great part of their length, furnish pieces of no great size. Mammoth ivory, obtained in Siberia, is brittle. Sea-cow's teeth are useful for small articles. Walrus, narwhal, sperm whale tusks, etc., furnish ivory of inferior quality. The supply of ivory has on the whole remained fairly constant during the past twenty years, but it cannot be maintained for many years longer, the elephants in the interior of Africa becoming scarcer. Celluloid is to a limited extent a substitute, but it has not the waxy appearance of ivory and will not take so fine a polish. Vegetable ivory (see List of Commodities) serves for small articles, and an artificial material called lactite is manufactured of milk, borax, and vitriol.

### IVORY (INCLUDING WALRUS' TEETH, Etc.), SOURCES OF BRITISH SUPPLY (Average 1903-5)

Total—9,612 cwts., value £375,317

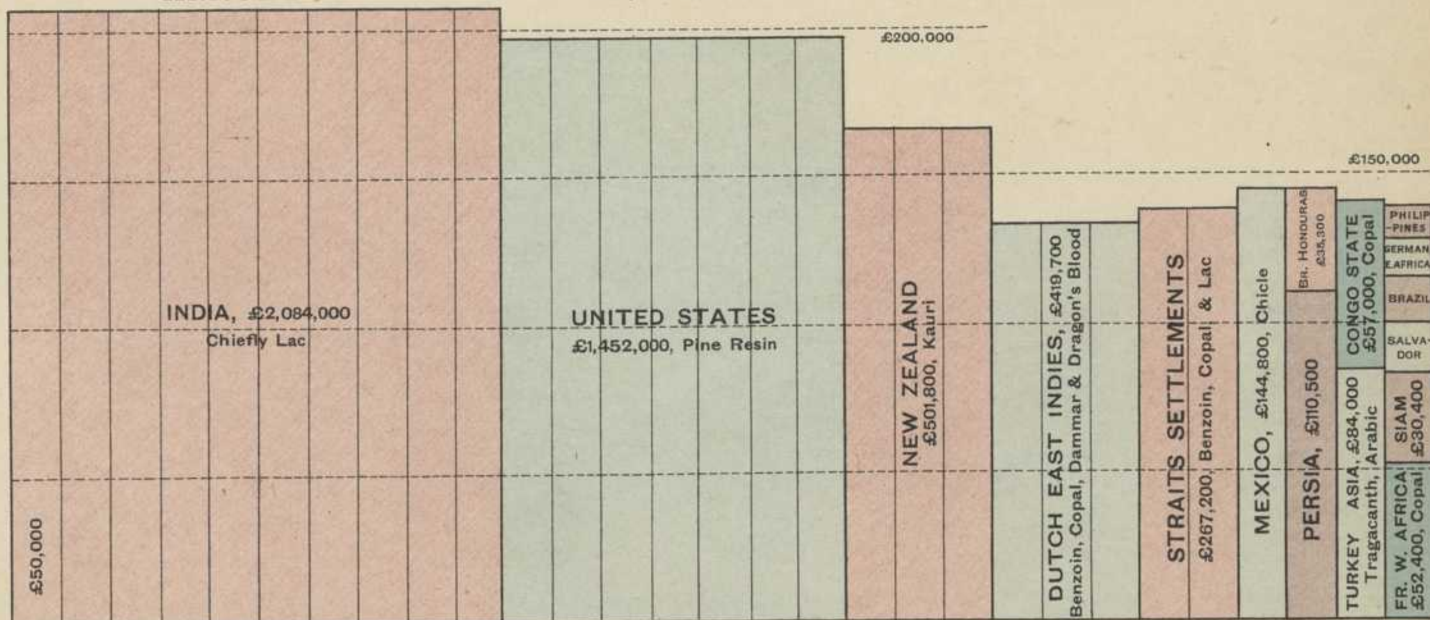
| Source | Quantity |
|---|---|
| BELGIUM & CONGO STATE | 2,241 cwts. or 23·3 % |
| EGYPT | 1,263 cwts. or 13·1 % |
| GERMANY AND GERMAN WEST AFRICA | 1,213 cwts. or 12·6 % |
| BRITISH EAST AFRICA | 1,062 cwts. or 11·1 % |
| FRANCE AND FRENCH WEST AFRICA | 960 cwts. or 10·0 % |
| UNITED STATES | 751 cwts. or 7·8 % |
| INDIA | 609 cwts. or 6·3 % |
| ADEN DEPENDENCIES | 434 cwts. or 4·5 % |
| PORTUGAL & P. AFRICA | 249 CWTS. OR 2·6 % |
| MALTA | 245 CWTS. OR 2·6 % |
| BRITISH W. AFRICA | 200 CWTS. OR 2·1 % |
| HOLLAND | 160 CWTS. OR 1·7 % |
| TRIPOLI | 1·1 % |
| OTHERS | 1·2 % |

### RISE AND FALL IN IMPORT PRICE OF IVORY






### ANNUAL EXPORTS OF GUMS, RESINS, Etc., FROM PRINCIPAL COUNTRIES




The various gums, resins, balsams, etc., are described under separate headings in the List of Commodities. In the above diagram are shown the principal exports, several other countries contributing small quantities to the commerce of the world. India is the chief source of lac; of other gums it imports more than it exports. The United States produces a large quantity of resin derived from pines of temperate climes, which yield also turpentine. France does not export rough resin, but only a highly refined product. Russia and Greece also produce pine resin, which in the latter country is largely used to flavour wine. The chicle gum of Mexico and British Honduras is used for chewing. Salvador produces Balsam of Peru; Brazil copal resin and copaiva balsam.

### WAX (INCLUDING OZOKERIT AND EARTH WAX), SOURCES OF BRITISH SUPPLY (Average 1903-5)

Total—16,124 cwts., value £215,539

| Source | Quantity |
|---|---|
| GERMANY | 16,124 cwts. or 34·2 % |
| BRAZIL | 7,464 cwts. or 15·9 % |
| INDIA | 2,939 cwts. or 6·2 % |
| HOLLAND | 2,816 cwts. or 6·0 % |
| UNITED STATES | 2,696 cwts. or 5·7 % |
| JAPAN | 2,209 cwts. or 4·7 % |
| PORT. E. AFRICA | 1,681 cwts. or 3·6 % |
| MOROCCO | 1,574 cwts. or 3·3 % |
| FRANCE | 1,544 cwts. or 3·3 % |
| CHILE | 1,324 cwts. or 2·8 % |
| BRITISH AFRICA | 851 CWTS. OR 1·8 % |
| BR. W. INDIES | 1·7 % |
| MADAGASCAR | 1·3 % |
| ITALY | 1·2 % |
| SPAIN | 1·1 % |
| OTHER COUNTRIES | 3,399 CWTS. OR 7·2 % |

# IVORY, GUMS, RESIN, WAX, &c.



EXPLANATION OF COLOURING

Ivory

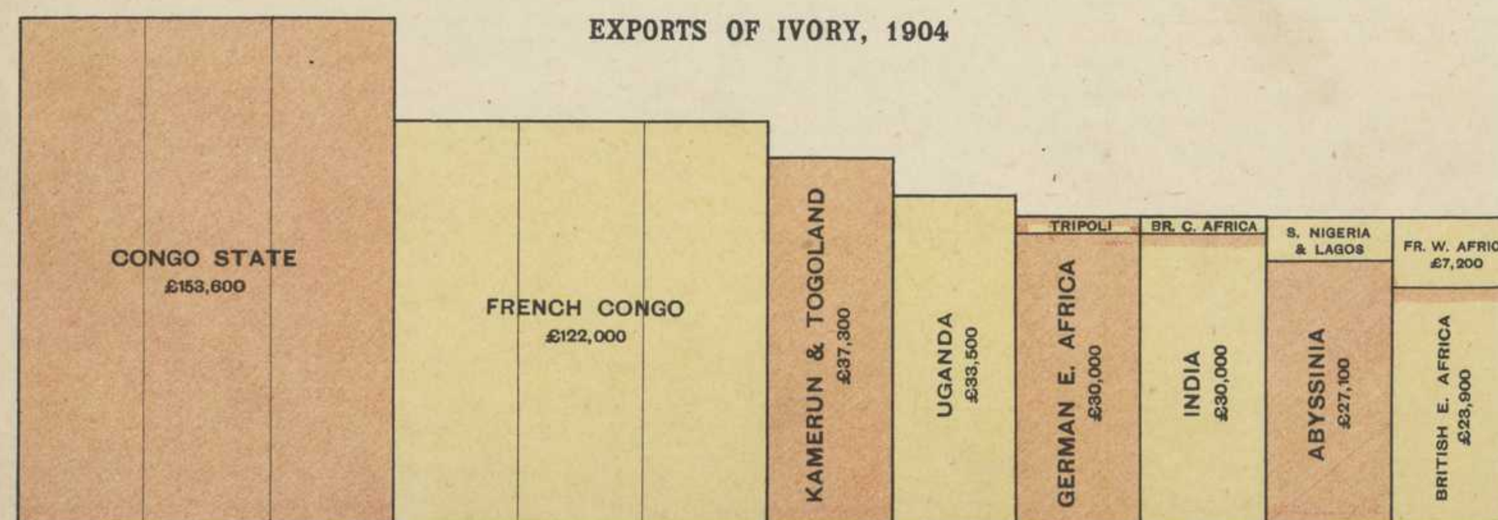
Wax (Countries with surplus of Exports)

Gums & Resins

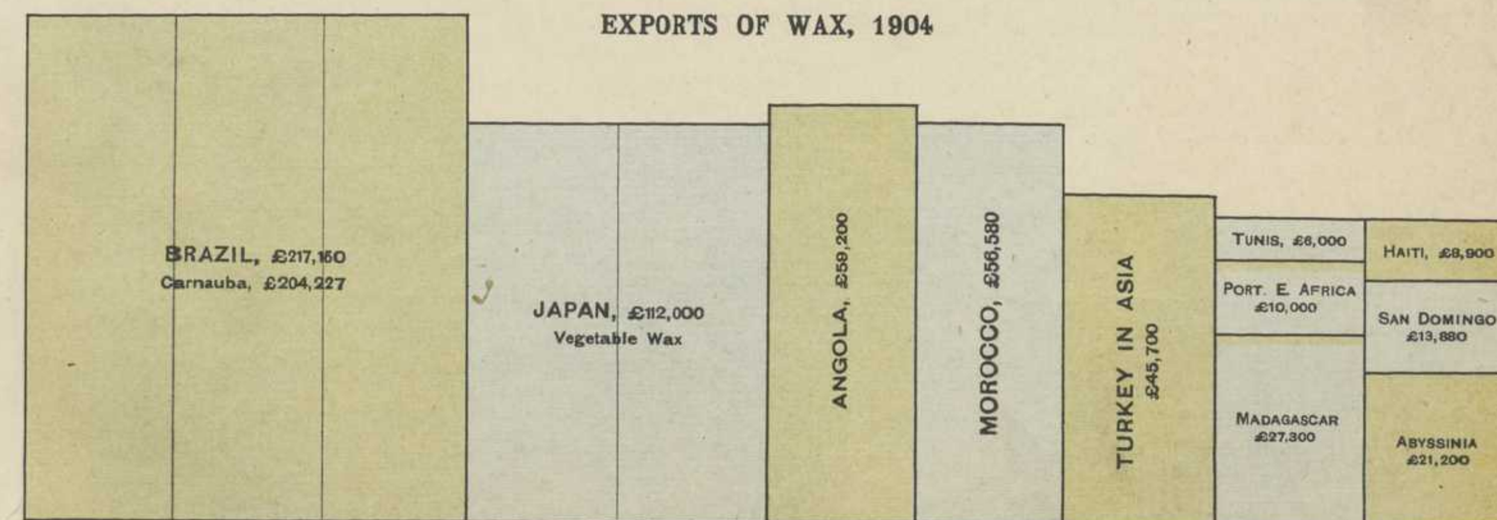




EXPORTS OF IVORY, 1904



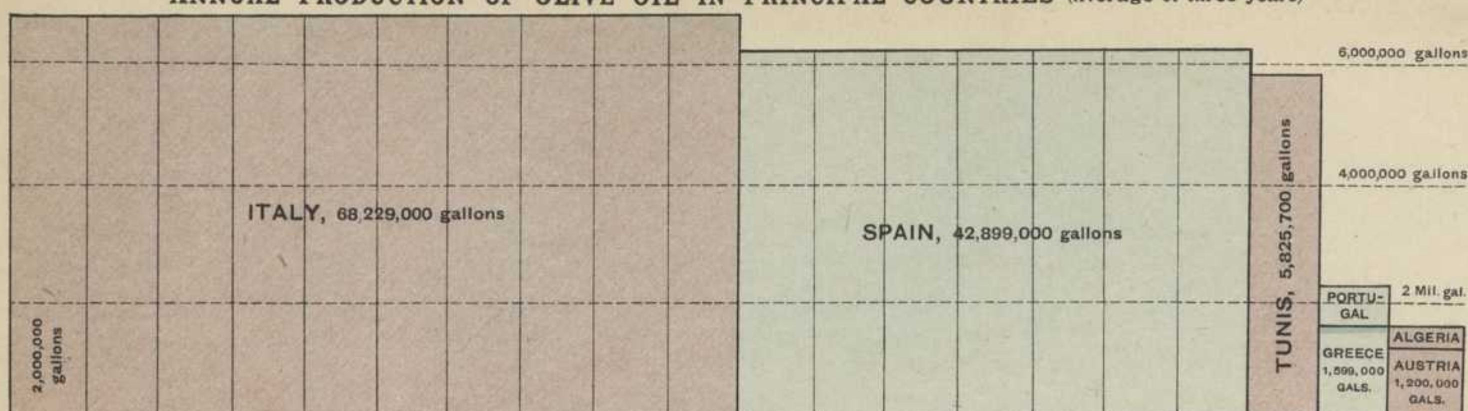

EXPORTS OF WAX, 1904




John Bartholomew & Co. Edin^r

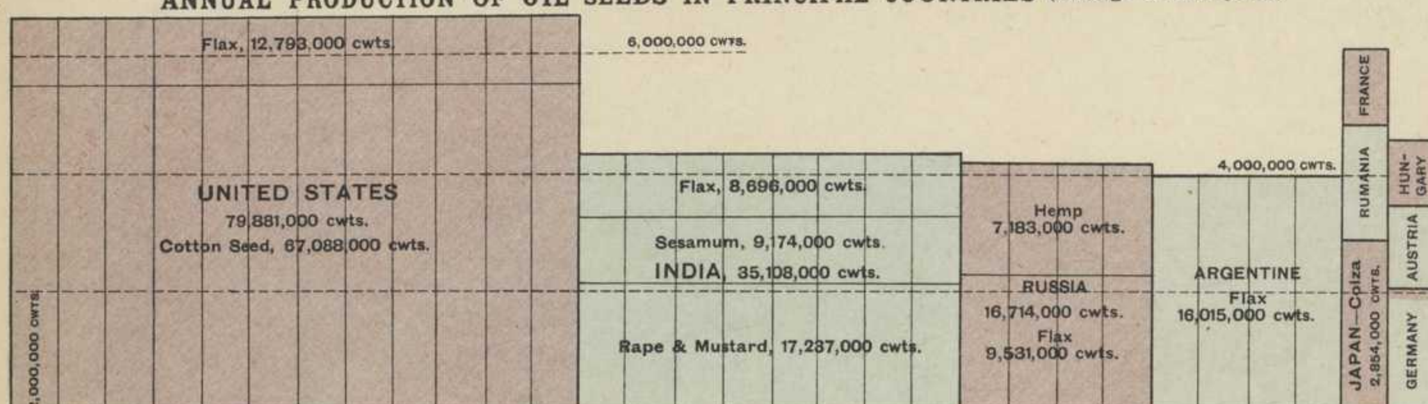
# VEGETABLE OILS.

## ANNUAL PRODUCTION OF OLIVE OIL IN PRINCIPAL COUNTRIES (Average of three years)



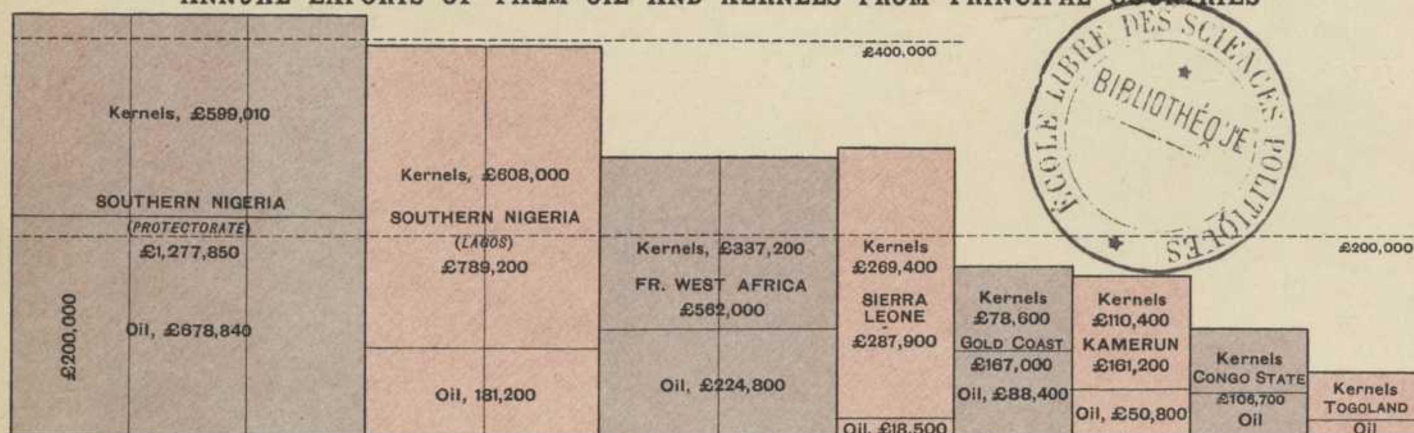

The quantities given for Portugal, Greece, and Algeria, are exports only. For imports into the United Kingdom see the List of Commodities.

## ANNUAL PRODUCTION OF OIL SEEDS IN PRINCIPAL COUNTRIES (Average of three years)




The oil-yielding seeds are so numerous that it is impossible to show all the crops of even the few countries represented. For instance, in India a large acreage is under miscellaneous oil-seeds of which the quantities are not reported, and Russia produces some rape and sunflower seeds. Beans, ground-nuts, and other sources of oil are marked on the map. Cotton seed, which in the United States was scarcely utilized before 1870, now yields annually a value nearly one-seventh of that of the average cotton crop. The value in the diagram is that of the seeds crushed for oil in the United States and of the exported seeds. For imports of seed-oil into the United Kingdom see the List of Commodities.

## ANNUAL EXPORTS OF PALM OIL AND KERNELS FROM PRINCIPAL COUNTRIES






This is the produce of the oil palm proper, *Elæis Guineensis*. It will be noticed that in most cases the export of kernels is much greater value than that of oil. The reason is that the natives use much of the oil from the pulp, which they can easily press out. For imports into the United Kingdom see List of Commodities.

## ANNUAL EXPORTS OF COPRA FROM PRINCIPAL COUNTRIES

DUTCH EAST INDIES
£1,086,900
CEYLON
£981,340
Coco-nut Oil, £654,400
STRAITS SETTLEMENTS
£778,230
PHILIPPINES
£648,940
MALAY ST.
GERMAN OCEANIA
£182,790
SOCIETY IS.
£68,720
INDIA
£130,200
BRIT. SOLOMON IS.
ZANZIBAR
£118,740
TONGA IS.
£67,340
SAMOA
£98,980
GILBERT & ELLICE IS.
NEW CALEDONIA
GERMAN EAST AFRICA

## RISE AND FALL IN IMPORT PRICE OF VEGETABLE OILS

1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905
40 38 36 34 32 30 28 26 24 22 20 18
OLIVE OIL Price in £ per tun
SEED OIL Price in £ per ton
COCOA NUT OIL Price in sh. per cwt.
PALM OIL Price in sh. per cwt.



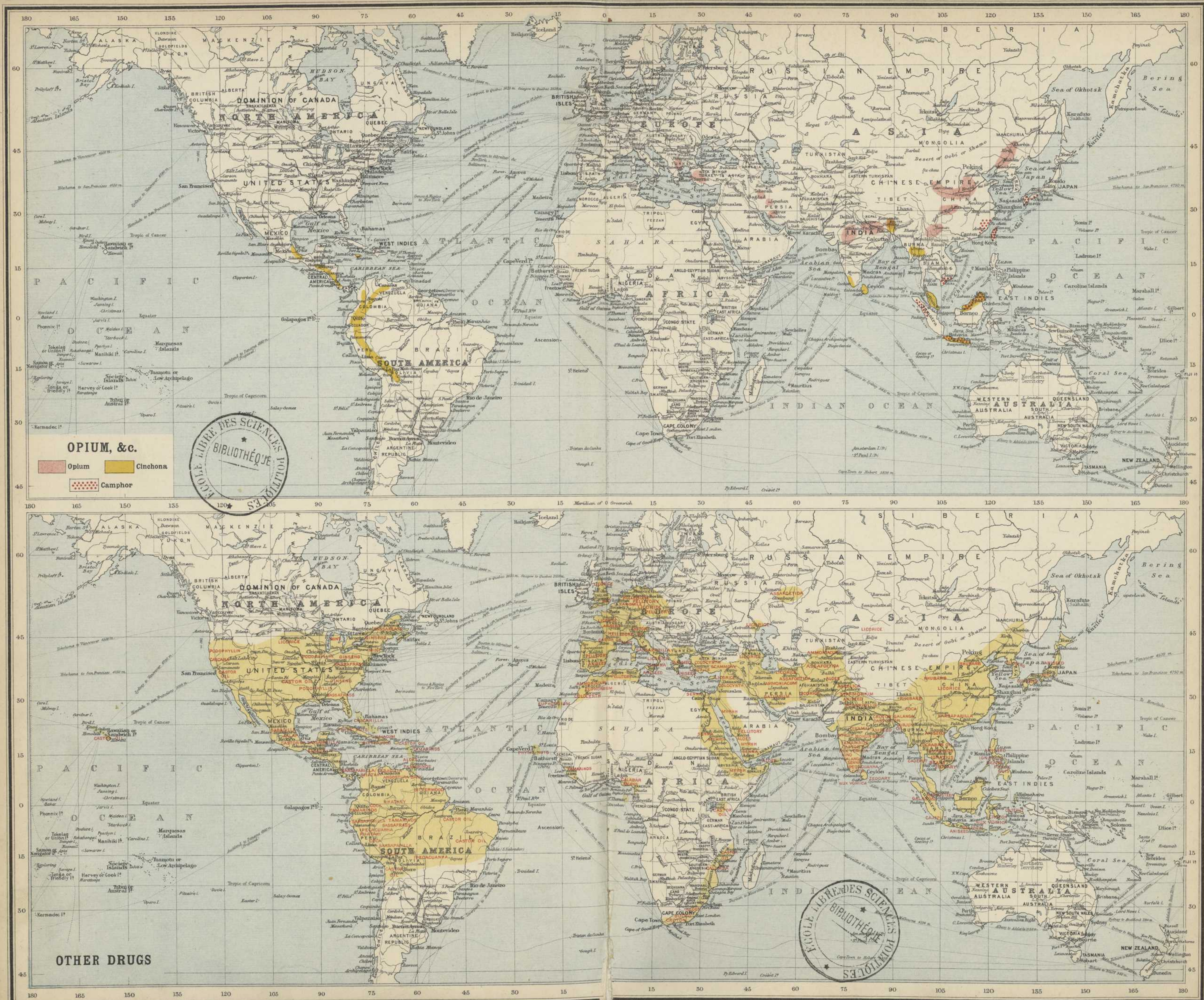

EXPLANATION OF COLOURING

Olive Oil

Other Vegetable Oils

COPRA THROUGHOUT OCEANIA

John Bartholomew & Co. Edin.



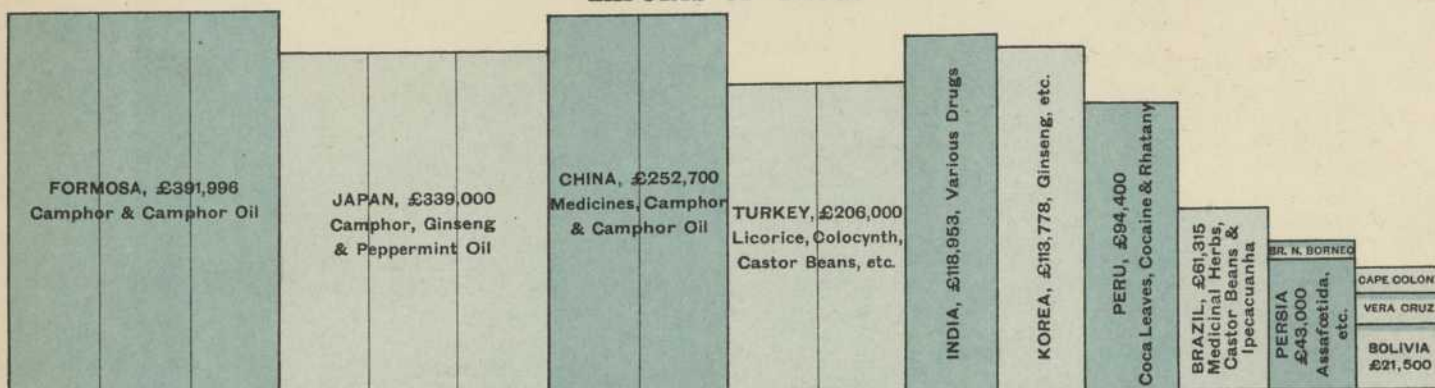




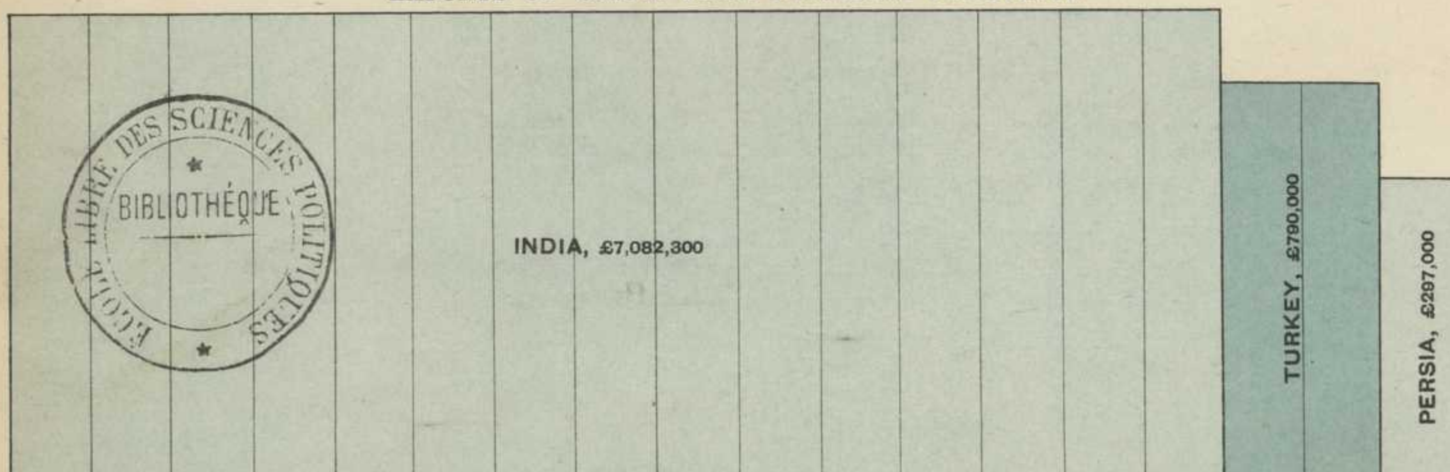
John Bartholomew & Co. Edinr.

# DRUGS.

**General Summary.**—Drugs is a very wide term including a large number of mineral, vegetable, animal, and chemical preparations, and the druggist deals in many articles of perfumery, etc., besides medicines. Statistics of raw material, with which this atlas is chiefly concerned, are difficult to obtain in the case of drugs. Many medicines of vegetable origin are prepared from plants growing wild or cultivated in small quantities in many countries, and the finished preparations are exported with others, including many used for industrial purposes, under the general head of "Drugs and Chemicals." The diagrams below show some large exports of vegetable drugs, for the most part in their natural state, or having undergone a simple process of extraction. They are such as are used in medicine, though some are also applied to other purposes; for instance, probably 70 per cent. of the camphor produced is used in making celluloid, and a considerable quantity in the manufacture of smokeless powder. From castor oil soap is made. Opium is consumed, especially in the East, as a pleasant narcotic, and licorice is formed into sweets, and in some countries is mixed with tobacco. Cinchona bark and quinine are dealt with in the List of Commodities.

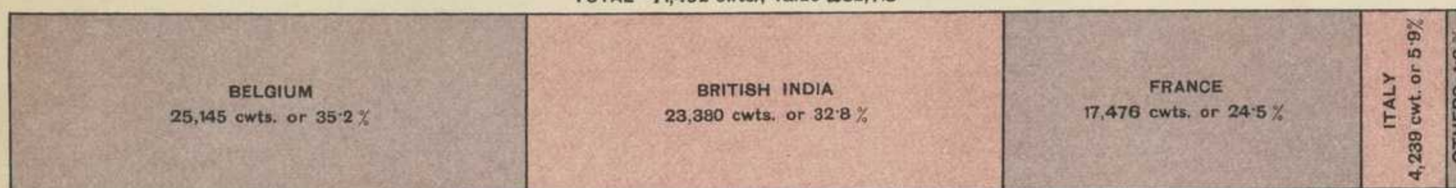


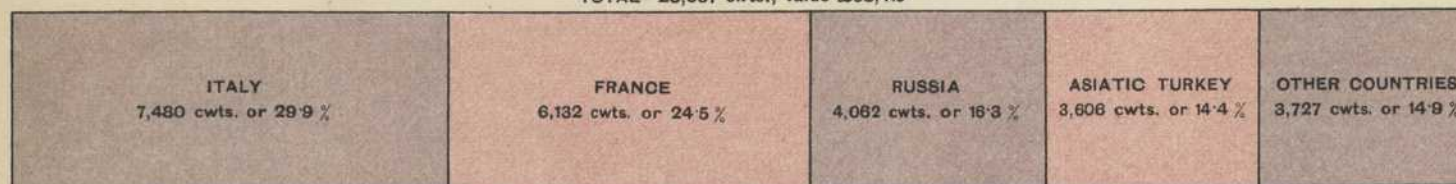

Formosa is the most important source of camphor, only a small quantity comes from Fokien in China, and a still smaller, shown in the diagram, from British North Borneo. Ginseng is a drug appreciated only in China. Bolivia exports coca-leaves, Vera Cruz jalap, and Cape Colony buchu leaves, aloes, and quince seeds. Japan and the United States are the chief producers of peppermint.

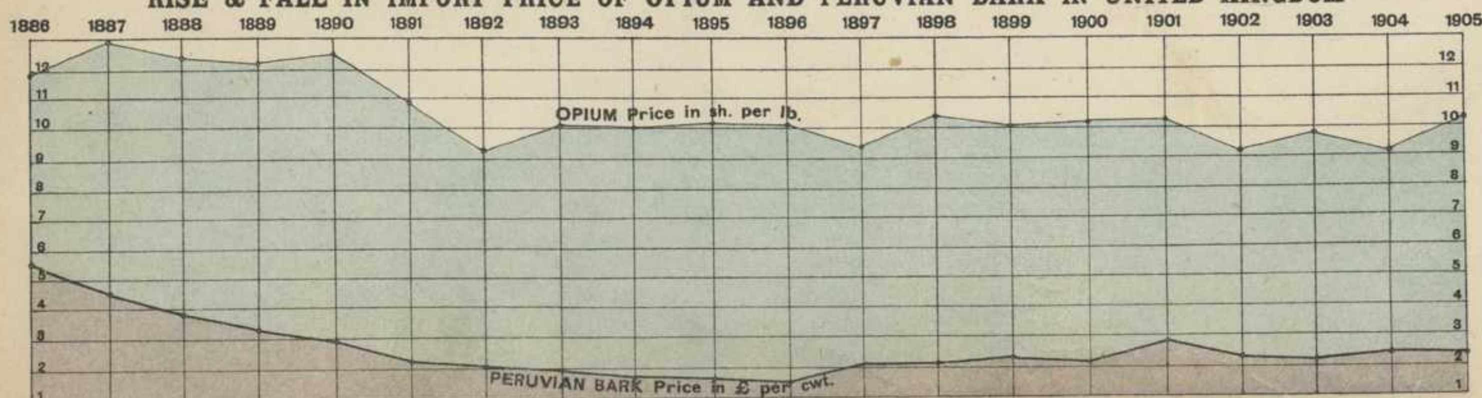




The chief customer of India is China, which imported opium to the value of £5,316,800 in 1904. The measures recently taken to suppress opium-smoking in that country must, if strictly carried out, have a marked effect on the industry. The United Kingdom imported opium to the value of £281,213 in 1905, fully 42 per cent. coming from Turkey.



# FISH OILS, HIDES & SKINS.

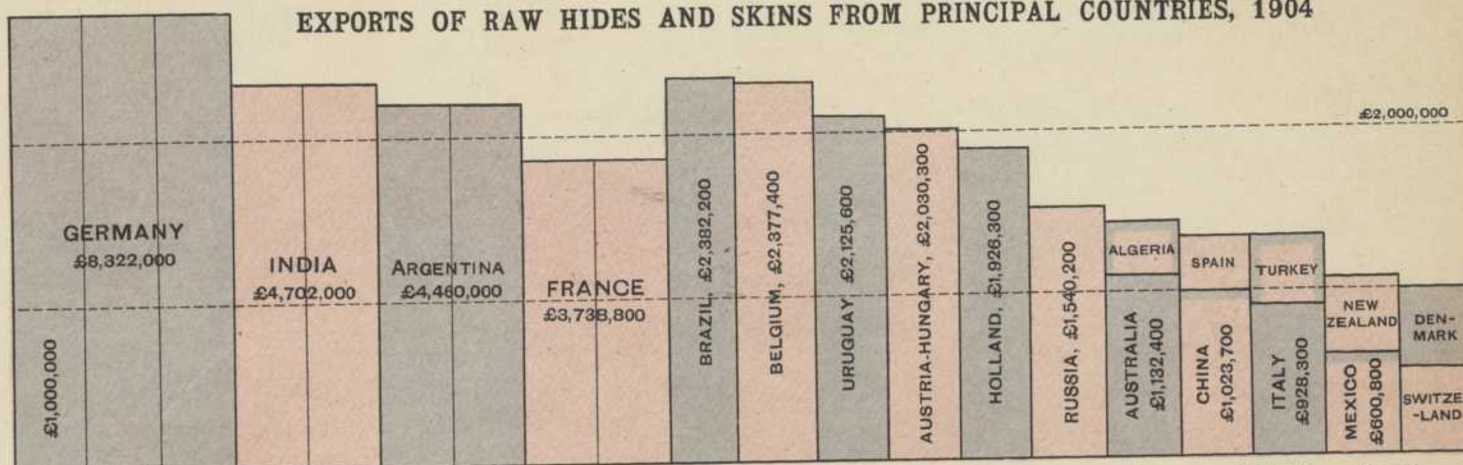
**FISH OILS.**—Fish oils are obtained from the blubber of several cetacea, of which the "right" whale and the bowhead yield the largest quantities (see WHALES in the List of Commodities), and the sperm whale, the black-fish, and porpoise oils of considerable value; from seals, caught especially off the coasts of Newfoundland and Labrador, in the Arctic and North Atlantic Oceans, and in the southern hemisphere; and from many kinds of fish, including cod, hake, and other members of the cod family, sharks, sardines, herrings, and in the United States, from the menhaden, a member of the herring family. The annual production of crude fish oils throughout the world is estimated at 15¼ million gallons, of which whales yield nearly one-sixth. As an illuminant and lubricant, fish oil has been to a great extent superseded by mineral and vegetable oils.

### FISH OILS (Fish, Blubber, Sperm, etc.)—SOURCES OF BRITISH SUPPLY (Average 1903-5)

Total—24,036 tuns, value £424,097

| | |
|---|---|
| NEWFOUNDLAND | 8,538 tuns or 35·5 % |
| DENMARK With Iceland and Greenland | 4,904 tuns or 20·4 % |
| NORWAY | 3,256 tuns or 13·6 % |
| UNITED STATES | 2,788 tuns or 11·6 % |
| NORTHERN WHALE FISHERIES | 1,788 tuns or 7·4 % |
| JAPAN | 728 tuns or 3·0 % |
| BRAZIL | 674 tuns or 2·8 % |
| CANADA | 497 TUNS OR 2·1 % |
| PORTUGAL | 1·1 % |
| GERMANY | 1·0 % |
| OTHERS | 1·5 % |

### EXPORTS OF RAW HIDES AND SKINS FROM PRINCIPAL COUNTRIES, 1904

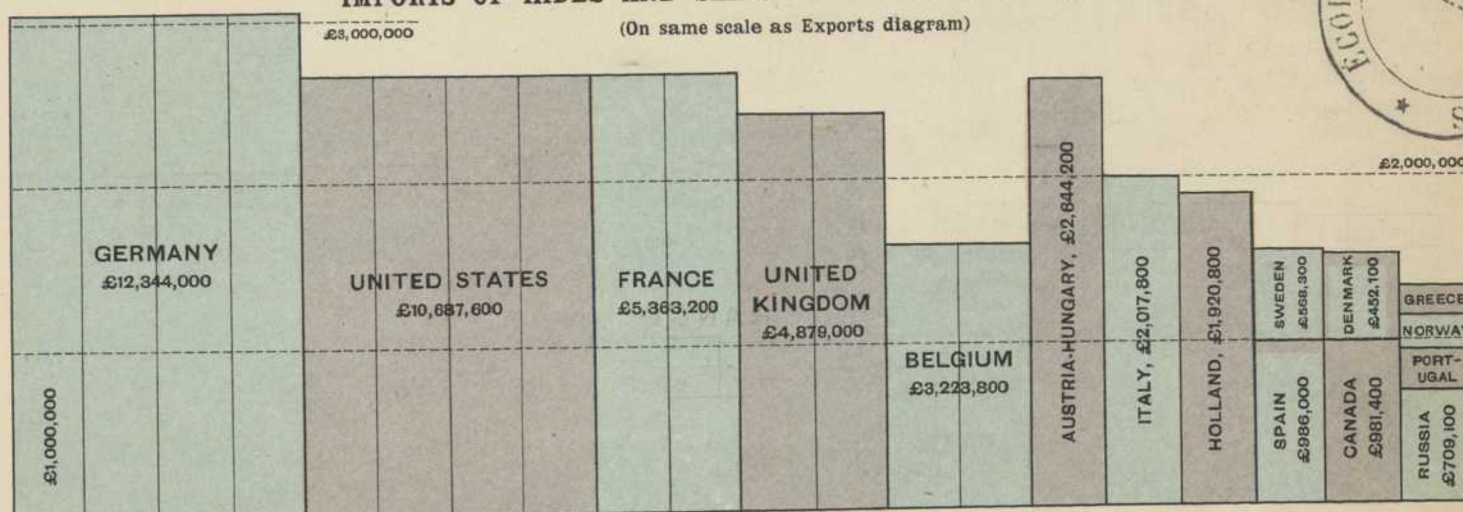



The exports shown above are those of hides and skins used chiefly for the manufacture of leather, that is, ox-hides, sheep, and goat skins, and a few pig, deer-skins, etc.



### IMPORTS OF HIDES AND SKINS INTO PRINCIPAL COUNTRIES, 1904

(On same scale as Exports diagram)



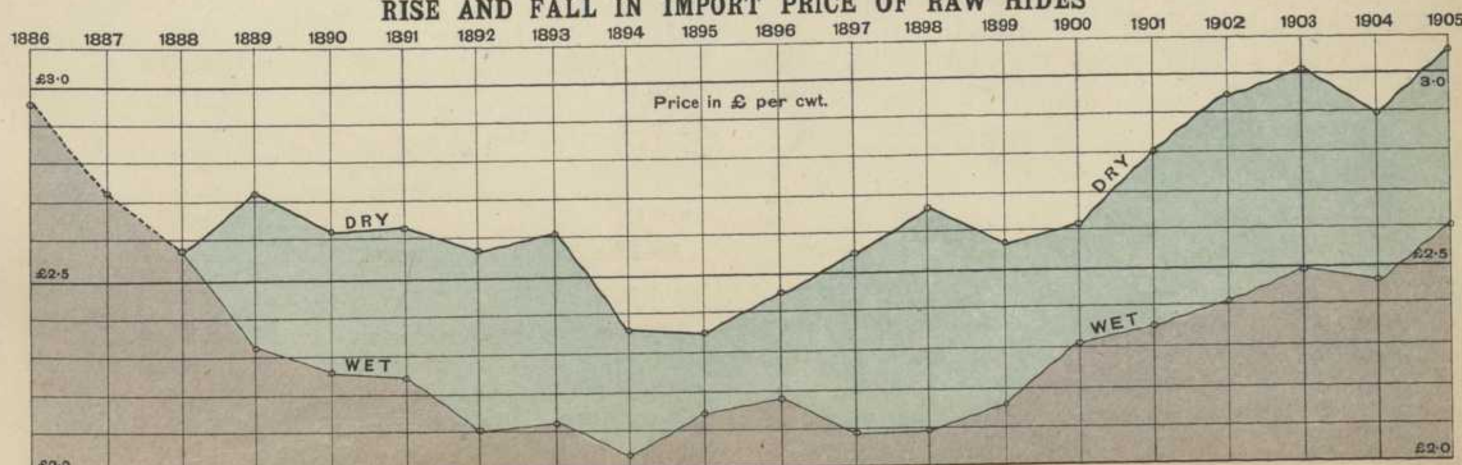

### SKINS (Undressed)—SHEEP, GOATS AND OTHERS—SOURCES OF BRITISH SUPPLY (1903-5)

SHEEP—16,565,907 skins, value £1,750,170. GOATS—13,258,995 skins, value £1,279,920
OTHERS—478,563 skins, value £23,987. TOTAL—30,303,465 skins, value £3,054,077

| | |
|---|---|
| BRITISH EAST INDIES | 6,893,938 skins or 22·8 % |
| NEW ZEALAND | 5,241,419 skins or 17·3 % |
| CAPE COLONY AND NATAL | 4,800,363 skins or 15·8 % |
| AUSTRALIA | 2,670,804 skins or 8·8 % |
| FRANCE | 1,809,525 skins or 6 % |
| ARGENTINA | 1,408,720 skins or 4·6 % |
| ADEN AND DEPENDENCIES | 1,189,532 SKINS OR 3·9 % |
| BRAZIL | 856,460 SKINS OR 2·8 % |
| RUSSIA | 794,957 SKINS OR 2·6 % |
| MOROCCO | 2·2 % |
| CHINA | 1·9 % |
| EGYPT | 1·8 % |
| TURKEY | 1·5 % |
| CHILE | 1·2 % |
| HOLLAND | 1·2 % |
| GERMANY | 1·1 % |
| SPAIN | 1·1 % |
| OTHERS | 3·4 % |

For British imports of hides see the List of Commodities.

### RISE AND FALL IN IMPORT PRICE OF RAW HIDES




FISH OILS
EXPLANATION OF COLOURING
Whale
Cod, Herring & Menhaden
Shark
Seal, & Sea Elephant
Other kinds of Fish Oil
HIDES & SKINS
EXPLANATION OF COLOURING
Countries producing Hides & Skins
Countries with Surplus Export
Centres of Leather Industry
NORTH AMERICA
DOMINION OF CANADA
UNITED STATES
SOUTH AMERICA
EUROPE
AFRICA
ASIA
AUSTRALIA
RUSSIAN EMPIRE
CHINESE EMPIRE
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
GREENLAND
SIBERIA
SPERM WHALE
RIGHT WHALE
HUMPBACK WHALE
SEA ELEPHANT

# DYEING & TANNING MATERIALS






## NATURE OF BRITISH IMPORTS OF DYEING & TANNING MATERIALS
(CHEMICAL DYES NOT INCLUDED). TOTAL VALUE—£2,177,589

EXTRACTS £652,174
UNENUMERATED 279,995 cwts., £272,151
VALONIA 513,040 cwts., £262,819
BARK 563,604 cwts., £243,580
MYROBOLANS 576,924 cwts., £159,474
GAMBIER 141,560 cwts., £148,172
INDIGO 8,201 cwts., £116,902
SUMAC 224,920 cwts., £104,086
CUTCH, 64,940 cwts., £72,543
LOGWOOD, 305,080 cwts., £71,508
OTHER DYE WOODS, £48,432
COCHINEAL

## EXPORTS OF DYEING & TANNING MATERIALS
FROM SOME OF THE CHIEF COUNTRIES

ARGENTINE £1,340,600 Quebracho Logs & Extracts
INDIA £859,200 Indigo, Cutch & Myrobolans
TURKEY £753,000 Valonia & Gall-nuts
AUSTRALIA, £189,600 BARK, CHIEFLY WATTLE
JAVA, £175,700 INDIGO
JAMAICA, £148,565 LOGWOOD & EXTRACT
CHINA £106,900
NATAL £102,666
ALGERIA
SALVADOR
MEXICO
BRIT. HONDURAS
GREECE
CANADA
TUNIS
UNITED STATES

## SOURCES OF BRITISH SUPPLY OF DYEING & TANNING MATERIALS
(CHEMICAL DYES NOT INCLUDED). TOTAL VALUE—£2,177,589

BRIT. EAST INDIES £498,887 or 22·9 % — Cutch, Indigo, Gambier, Myrobolans
FRANCE £281,674 or 12·9 % Extracts
TURKEY £263,118 or 12·1 % Chiefly Valonia
ITALY £228,477 or 10·5 % — Extracts, Unenumerated, Sumac
NATAL, Bark, £125,962 or 5·8 %
AUSTRIA-HUNGARY, EXTRACTS, £102,691
ARGENTINE, £96,606 or 4·4 % EXTRACTS, DYEWOODS
AUSTRALIA, Bark, £91,995 or 4·2 %
SPAIN, £78,680 or 3·6 %
BR. W. INDIES & HONDURAS, £67,412
OTHER COUNTRIES £342,027 or 15·8 %

John Bartholomew & Co. Edin.r

# GENERAL COMMERCIAL GAZETTEER OF THE COUNTRIES & PORTS OF THE WORLD

(ABBREVIATIONS.—B. C. = British Consul; B. V.-C. = British Vice-Consul. For list of Steamship Line abbreviations see Table of Travel Routes on page liii.)

**Aalborg,** seaport, Denmark, on Liimfjord. Lat. 57° 3′ N.; long. 9° 57′ E.; 35 miles SW. of Frederikshavn, and 470 m. from Leith. Pop. 31,500.

**Port Accommodation.**—Length of quayage, 3500 yards, with railway facilities. Depths of harbours, 15 to 22 ft.

**Steamship Communication.**—Regular sailings to Copenhagen.

**Trade.**—Exports: cattle, hides, wool, dairy produce, &c.; imports: coal, salt, petroleum, grain, and manure. B. V.-C.

**Aalesund,** seaport, with important cod fisheries, Norway. Lat. 62° 24′ N.; long. 6° 5′ E.; 66 miles by sea WSW. of Christiansund, and 768 m. from London. Pop. 12,000.

**Port Accommodation.**—The Aspevaagen has depth of water for largest vessels. Quayage, 941 ft., with depths from 16 to 24 ft. at low water. Rise and fall of tides, 6 to 7 ft.; three patent slipways.

**Steamship Communication.**—Wilson line from Hull.

**Trade.**—Exports (1904), £311,800; imports, £156,800.

**Aarhus,** seaport, Denmark, on E. coast Jutland. Lat. 56° 9′ N.; long. 10° 14′ E. Distant 541 miles from Aberdeen; 1061 m. from Cardiff; 576 m. from Dundee; 586 m. from Hull; 591 m. from Leith; 665 m. from London; and 563 m. from Tynemouth. Pop. (1901), 51,814.

**Port Accommodation.**—Quayage, 9067 ft., with depth of 24 ft. alongside. Depth in entrance channel, 25 ft. Railway to all parts.

**Steamship Communication.**—Regular sailings to Copenhagen.

**Trade.**—Exports: cattle, bacon, eggs, agricultural produce; imports: coal, timber, manures, petroleum, &c. B. C.

**Aberdeen,** seaport city and coaling station on E. coast of Scotland, at mouth of R. Dee. Lat. 57° 9′ N.; long. 2° 8′ W. Distant by water 84 miles from Leith; 256 m. from Hull; 427 m. from London; 564 m. from Liverpool; 58 m. from Dundee; and 719 m. from Cardiff. Pop. 153,114.

**Port Accommodation.**—Depth for vessels entering port at high water, ordinary spring tides, 25 ft.; high water, ordinary neap tides, 22 ft. The docks and tidal harbour have a total quayage of 15,484 ft. Depths in the docks range from 19 to 27 ft. 9 in. at highest spring tides. Three patent slips, graving dock, and pontoon. Railway communication to all parts.

**Steamship Communication.**—Regular sailings to London, Leith, &c.

**Trade.**—Exports: cattle, granite, fish, preserved meats, oats, paper, &c. (1905), £163,153; imports: coal, lime, iron, timber, salt, esparto, rags, manures, grain, &c., £872,150.




**Åbo,** seaport town and coaling station of Finland, Russia, on R. Aurajoki, 170 miles by rail NW. of Helsingfors. Lat. 60° 26′ N.; long. 22° 19′ E. Distant by water 1099 miles from London; 166 m. from Stockholm; and 389 m. from Danzig. Pop. 35,000.

**Port Accommodation.**—Total length of quays, 2000 ft., to which vessels drawing 16 ft. can ascend. Depth of water in port about 20 ft. Four patent slips.

**Steamship Communication.**—Finland lines from Hull.

**Trade.**—Exports: wood, cereals, iron, paper, butter, &c.; imports: salt, iron, coal, textiles, foodstuffs, machinery, &c. B. C.

**Abyssinia.**—Area about 300,000 sq. m., but some boundaries undefined. Pop. 8,000,000.

**Physical Features.**—A mountainous irregular tableland, with an average height of about 7000 ft., with summits rising to 15,000 ft. The N. slopes drain by the Atbara, Abai, and Sobat to the Nile. Several lakes, the largest being Tsana.

**Climate.**—Two seasons; the rainy from June to September, and the dry season. Temperature varies with altitude, the mean ranging from 57.2° to 80.6°; lowlands hot and unhealthy.

**Resources and Production.**—Occupation of the people mainly pastoral; but little land under cultivation; cotton, sugar-cane, date-palm, and vine thrive well; the native produce includes eggs, millet, barley, hops, wheat, tobacco, coffee (about 50,000 bags annually); the forests contain valuable timber. The chief exports are coffee, £71,400; hides, £31,846; ivory, £13,124; other articles, £14,571. Imports (1902), £106,443; from U.K. (1904), £10,324, more than half coal.

**Railway.**—Length of line between Jibouti and Diré Dawa, 186 miles.

**Acajutla,** port, with open roadstead, Salvador. Lat. 13° 35′ N.; long. 89° 45′ W.; 50 miles SW. of San Salvador.

**Port Accommodation.**—Vessels generally lie in the roadstead about a mile from shore, where there is an anchorage in 9 to 11 fathoms. There is also an iron pier, with 18 ft. alongside at high water.

**Steamship Communication.**—From San Francisco by Pacific Mail S.S. Co.

**Trade.**—Exports: coffee, dyestuffs, &c.; imports: textiles, sacking, iron, &c. B. V.-C.

**Acapulco,** seaport town and coaling station, Mexico, on Pacific coast. Lat. 16° 50′ N.; long. 99° 46′ W. Distance from London *viâ* Suez, 18,263 miles; from Valparaiso, 3390 m.; Callao, 2198 m.; Guayaquil, 1737 m.; Panama, 1410 m.; San Francisco, 1830 m.; and Honolulu, 3305 m. Pop. 6000.

**Port Accommodation.**—Depth in port varies from 34 to 136 ft., but vessels load and discharge by means of lighters. Water area of harbour, 1000 acres.

**Steamship Communication.**—From San Francisco by P.M.

**Trade.**—Exports: hides, skins, cotton, indiarubber, &c.; imports: textile fabrics, silks, iron, steel, machinery, &c. B. V.-C.

**Accra,** chief town of Gold Coast colony, West Africa. Lat. 5° 35′ N.; long. 0° 10′ W. Distance by sea from Liverpool, 3843 miles; London, 3873 m.; Cardiff, 3712 m.; and Glasgow, 3941 m. Pop. 16,500.

**Port Accommodation.**—Loading or discharging is done by means of surf boats; vessels generally anchoring in from 5 to 5½ fathoms of water, about a mile from the shore. The construction of harbour works has been sanctioned.

**Steamship Communication.**—B. & A. S.N. from Liverpool; Woermann line from Hamburg.

**Trade.**—Exports: gold-dust, gum, ivory, palm-oil, &c.; imports: cottons, pottery, &c.

**Acre,** or **Akka,** seaport of Syria, Asia Minor. Lat. 32° 57′ N.; long. 35° 5′ E. Pop. 12,000.

**Trade.**—The exports consist mainly of grain, oil-seeds, olive-oil, and wool.

**Adalia,** seaport of Asia Minor on Gulf of Adelaide, at E. end of the Mediterranean. Lat. 36° 52′ N.; long. 30° 45′ E. Pop. 30,000.

**Trade.**—Exports consist of grain, cattle, wood, goat-skins, &c.; imports, chiefly cotton goods, rice, pepper, sugar, coffee, petroleum, &c.

**Adelaide.** *See* **Port Adelaide.**

**Aden,** a British possession, and strongly fortified coaling station, on the S. coast of Arabia, E. of the Strait of Bab-el-Mandeb, and the entrance to the Red Sea. Lat. 12° 45′ N.; long. 45° 10′ E. Distant from Suez, 1345 miles, and from Bombay, 1664 m. Pop. (1901), 41,222.

**Port Accommodation.**—Outer harbour affords good anchorage for vessels in 6 fathoms. Bar at entrance has been removed, and inner harbour dredged to a depth of 26 ft. at low water of ordinary spring tides. Facilities for ship and machinery repairs; coaling night and day; loading and discharging by lighters and launches.

**Steamship Communication.**—From London by B.I.S.N., and P.O.; from Southampton by N.D.L.; from Liverpool by the C.T.; from Marseilles by M.M.; and from Genoa, Naples, and Venice by F. Rub. line.

**Trade.**—Aden has a large transhipment trade, and is the chief mart of commerce between Asia and Africa. The exports are mainly coffee, dyes, hides and skins, tobacco, ivory, pearls, ostrich feathers, gums, spices, &c.; and the imports, coal, cotton and silk goods, grain, metals, provisions, &c. Exports (1905), £2,737,000; imports, £3,062,000.

Resident, under the government of Bombay.

**Afghanistan.**—Area about 250,000 sq. m. Pop. 5,000,000.

**Physical Features.**—Surface rugged, and intersected by mountains, plains, and lofty plateaus. Drained by the Oxus, Murghab, Hari-rud, Helmand, Argandab, Kabul, Kuram, Gumul, &c.

**Climate.**—Great heat in summer, and intense cold in winter, but generally healthy. Rainfall slight, but snowfall heavy in the highlands.

**Resources and Production.**—Inhabitants largely engaged in pastoral pursuits. The chief crops grown are wheat, barley, lentils, rice, maize, millet, tobacco, peas and beans; assafœtida is cultivated; and the fruits grown include the apple, pear, almond, peach, quince, apricot, plum, sherry, pomegranate, grape, fig, mulberry, &c.

**Exports** to India (1903-4), £339,875; to Russia, £310,000. **Imports** from India, £517,326; from Russia, £120,000.

**Aguilas,** seaport on S. coast Spain. Lat. 37° 23′ N.; long. 1° 37′ W.; 40 miles W. of Cartagena. Pop. (1900), 15,868.

**Port Accommodation.**—Depth of harbour at entrance, 54 to 69 ft. Quay protected by breakwater. Quayage, 600 ft.; depth alongside, 21 to 23 ft. At El Hornillo Pier (558 ft. long) iron ore can be conveniently tipped from waggons into ship's hold. Depth at entrance, 55 to 105 ft.; at pier berths (forward) 40 ft., (aft) 26 ft.; pierhead, 40 ft.

**Trade.**—Exports are esparto, and iron and zinc ores. B. V.-C.

**Ajaccio,** seaport and coaling station, Corsica. Lat. 40° 55′ N.; long. 8° 44′ E. Pop. (1901), 21,779.

**Port Accommodation.**—Good anchorage and no bar; depth available for vessels entering port, 35 ft.; quayage, 2000 ft.; depth alongside 250 ft. of quay, 22 ft.

**Trade.**—Chiefly with France. Exports: wood, sardines, anchovies, wine, fruit, &c.; imports: tobacco, spirits, and foodstuffs. B. C.

**Akassa,** transhipment port and coaling station, W. Africa, at Nun mouth of R. Niger. Lat. 4° 15′ N.; long. 6° 5′ W.

**Port Accommodation.**—Anchorage 3 miles off in 40 ft.; slipway.

**Trade.**—Exports are ground-nuts and palm-oil; imports: cotton fabrics, cutlery, provisions, &c.

**Akyab,** seaport, Arakan, Burma. Lat. 20° 5′ N.; long. 92° 54′ E. Pop. (1901), 31,687.

**Port Accommodation.**—Tidal harbour with wharf and two piers, and high water depths from 10½ to 29½ ft. Anchorage in port in 30 ft. at low water. Slipway.

**Steam Communication.**—B.I.S.N. from Calcutta.

**Trade.**—Exports are chiefly rice.

**Albany,** fortified seaport and coaling station, in Princess Royal Harbour, King George Sound, Western Australia. Lat. 35° 2′ S.; long. 117° 54′ E. Distance from London *viâ* Suez, 9750 miles; from Aden, 5148 m.; from Adelaide, 1007 m. Pop. (1901), 3650.

**Port Accommodation.**—Harbour with water area of 2¼ by 3 m., and high water depth at entrance of 32½ ft. Small floating dock. Good railway facilities.

**Steam Communication.**—From London by Orient and P. and O. lines.

**Trade.**—Exports are wool, gold, pearl shells, wood, hides, &c.; imports: coal and general merchandise. Total value, £950,000.




**Alexandretta,** or **Iskanderun,** the port of Aleppo and Antioch in Syria. Lat. 36° 36′ N.; long. 36° 9′ E. Pop. 7000.

**Port Accommodation.**—Depth at entrance, 7 fathoms. No quays or docks. Loading and discharging by lighters only.

**Steam Communication.**—Papayanni line from Liverpool.

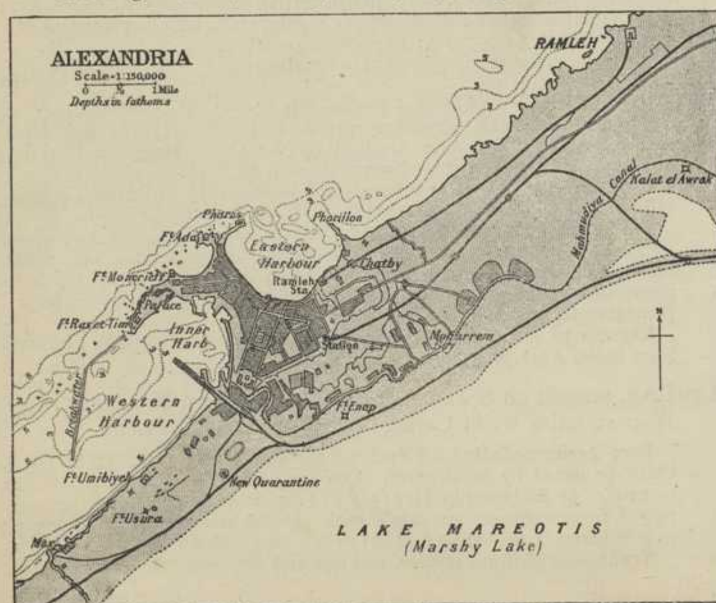
**Trade.**—Exports are cotton, wool, grain, liquorice root, hides, seeds, &c. (1904), £1,561,000; imports: manufactured goods, rice, corn, salt, &c., £2,170,000. B. V.-C.

**Alexandria,** coaling station and chief port of Egypt, on the Mediterranean. Lat. 31° 12′ N.; long. 29° 51′ E.; 3097 miles by sea from London. Pop. (1902), 310,587.

**Port Accommodation.**—Inner harbour of 464 acres, with depth of 40 ft.; outer harbour, 1400 acres, with maximum depth of 60 ft. Quayage with depth of 20 to 26 ft. alongside, 8865 ft.; with depth of 12 to 15 ft., 2735 ft., besides jetties. The Boghas Channel, 300 ft. wide, has a depth of 30 ft. at dead low water. Floating dock for vessels up to 2000 tons. Ample railway, canal, and river facilities.

**Steam Communication.**—Moss or Papayanni lines from Liverpool; Prince line from Manchester; P. and O. from Brindisi or Venice; Rub. from Genoa.

**Trade.**—Exports chiefly cotton and cotton-seed, besides sugar, cigarettes, onions, beans, gum-arabic, &c. (1904), £20,217,000; imports: cotton, woollen and silk goods, coal, hardware, timber, &c., £18,598,000. B. C.




**Algeria.**—Area, 184,470 sq. m. Pop. (1901), 4,740,000.

**Physical Features.**—The country is traversed by a great central plateau, between the Tell Atlas on the N. and the Sahara Atlas on the S. Shotts or shallow lakes in the plains.

**Climate** varies with altitude; it is equable on the coast. Mean temperature at Algiers, 64.3° F. (Jan. 54°, Aug. 78°). Rainfall abundant in winter.

**Resources and Production.**—Cultivated area (1902), 7,831,313 acres, of which 7,016,540 acres were under cereals. Wine, tobacco, and olive-oil are important products, and figs, oranges, and other fruits are grown. The forests yield cork and vegetable hair, and alfa or esparto grows on the plateau. Of live stock (1904) there were 1,080,554 cattle, and 8,611,747 sheep; besides horses, camels, pigs, &c. Total value of mineral produce (1904), £347,020 (chief, iron and zinc); of phosphates, £274,654.

**Shipping and Railways.**—Chief ports are Algiers, Oran, Bona, Benisaf, Philippeville, &c. Railways open (1904), 1940 m.

**Exports** (1905), £9,150,520. **Imports,** £15,355,500. Upwards of 80 per cent. of the trade is with France.

**Algiers,** seaport and coaling station, Algeria. Lat. 36° 47′ N.; long. 3° 4′ E. Distance from Marseilles, 402 miles; from London, 1728 m. Pop. (1901), 97,400.

**Port Accommodation.**—Water area of harbour, 235 acres; length of jetties, 6750 ft.; good quayage, with depths from 18 to 21 ft.; two dry docks and a floating dock. Railway to Oran and Tunis.

**Steam Communication.**—Moss and Papayanni lines from Liverpool, and C.G.T. from Marseilles.

**Trade.**—Exports are flour, esparto, wine, olive-oil, fruit, vegetables, wool, tobacco, bark, &c.; imports are coal, timber, animals, colonial produce, machinery, &c. B. C.




**Algoa Bay.** *See* **Port Elizabeth.**

**Alicante,** seaport SE. Spain. Lat. 38° 20′ N.; long. 0° 26′ W.; 40 miles NE. of Murcia. Distance from London, 1614 m. Pop. (1900), 50,142.

**Port Accommodation.**—Good anchorage in the roads. Depth at entrance and inside port, 22 ft. Adequate railway connections.

**Steam Communication.**—Spanish line from London.

**Trade.**—Exports are lead, almonds, liquorice, esparto, canary seed, wine, &c. (1904), £1,678,000; imports are coal, wood, staves, railway material, petroleum, tobacco, cod-fish, &c., £727,000. B. V.-C.

**Almeria,** seaport in S. of Spain. Lat. 36° 51′ N.; 2° 32′ W.; 1451 miles by sea from London. Pop. (1900), 47,326.

**Port Accommodation.**—Vessels drawing 25 ft. can discharge at quays. Length of quays, 740 yds.

**Trade.**—Exports are grapes, almonds, oranges, &c., esparto, iron (mostly to Great Britain); imports are coal, machinery, staves, timber, &c. B. V.-C.

**Altona,** free port and coaling station, adjoining Hamburg, *q.v.* Lat. 53° 33′ N.; long. 9° 58′ E. Pop. (1900), 161,501.

**Port Accommodation.**—Quayage, 2970 ft.; depth alongside at high water, 27 ft., low water, 21 ft.; quayage for trawlers and smacks, 210 ft.; depth at high and low water respectively, 19 and 11 ft. Floating dry dock.

**Ambriz,** port in Angola, W. Africa. Lat. 7° 50′ S.; long. 13° 10′ E.; 4856 miles by sea from London. Pop. 2500.

**Port Accommodation.**—Open anchorage in 6 fathoms, 4 m. from shore.

**Steam Communication.**—Woermann line from Hamburg.

**Trade.**—Exports are ivory, copal, indiarubber, coffee, gum, &c.; imports are wood, firearms, ammunition, glassware, rum, &c. Total trade, £119,600 (1905).

**Ambrizette,** port in Angola. Lat. 7° 14′ S.; long. 12° 55′ E.; 4816 miles from London.

**Port Accommodation.**—Anchorage in 6 fathoms 3 m. from shore.

**Steam Communication.**—Woermann line.

**Trade.**—Exports are ground-nuts and ivory.

**Amoy,** treaty port and coaling station in China. Lat. 24° 10′ N.; long. 118° 10′ E.; 280 miles NE. of Hong-Kong, and 9906 m. *viâ* Suez from London.

**Port Accommodation.**—Large, well-sheltered harbour for largest vessels. Anchorages in 7 to 14 fathoms. No quays. Loading and discharging by lighters. Dry docks.

**Trade.**—Exports chiefly tea and sugar (1905), £458,596; imports are cotton and woollen goods, metal-ware, opium, flour, &c., £1,406,108. B. C.

**Amsterdam,** seaport, Holland. Lat. 52° 22′ N.; long. 4° 53′ E.; 15 miles by North Sea Canal from Ymuiden. Distance from London, 208 m.; Leith, 369 m. Pop. (1899), 510,853.

**Port Accommodation.**—Extensive harbour for largest vessels. Over 28,000 ft. of quayage. Several dry docks. Canal and railway facilities.

**Steam Communication.**—Amsterdam Co. from London; Gibson's steamers from Leith.

**Trade.**—Largely a distributing one. Exports are butter, margarine, and cheese (mostly to United Kingdom), gin, linen, Westphalian coal, coke, and

iron; imports are coffee, tea, tobacco, rice, and other produce, wine, brandy, hardware, coal, &c. B. C.




**Ancona,** seaport, Italy, on the Adriatic. Lat. 43° 37′ N.; long. 13° 30′ E.; 123 miles by sea from Venice, and 2860 m. from London. Pop. (1901), 55,408.

**Port Accommodation.**—Good harbour with two quays available for vessels drawing 22 ft., in some parts, 24 ft.

**Steam Communication.**—Florio Rubattino from Venice.

**Trade.**—Exports are grain, hides, asphalt, sulphur, fruit, silks, &c.; imports are coal, petroleum, sugar, jute manufactures, &c. B. V.-C.

**Angola.**—A Portuguese colony of SW. Africa. Area 484,000 sq. m. Pop. 3,800,000.

**Physical Features.**—Low-lying coastal strip, with mangrove swamps; inland plateaus, with average elevation of 5000 ft.; very mountainous in the east; much of the interior is forest land. Principal rivers are the Kwanza, Kunene, and Kubango.

**Climate.**—Unhealthy near the coast; cooler on the highlands of the interior; rainfall scanty.

**Resources and Production.**—The main economic products are coffee, rubber, wax, sugar, vegetable oils, cocoanuts, ivory, oxen, and fish; among minerals found are copper and malachite, iron, petroleum, and salt.

**Railway.**—Length of railway open (1903), 226 m. A railway about 900 m. long from Lobito Bay to the eastern boundary is under construction.

**Exports** (1905), £1,496,000. **Imports,** £1,345,500.

**Annam.**—A protectorate of French Indo-China. Area 52,100 sq. m. Pop. (1901), 6,124,000.

**Physical Features.**—The surface between the coast and the fertile valley of the Mekong (the principal waterway) comprises a series of plateaus and mountain ranges of moderate elevation.

**Climate.**—Temperate during the summer months (June, July, and August), rises to 85°, or sometimes to 95° F. in daytime. Rainy season from September to January, with average temperature of 60° F.

**Resources and Production.**—Fertile soil, producing rice, maize, and other cereals, areca nut, mulberry, cinnamon, tobacco, sugar-cane, betel, manioc, bamboo, timber of various kinds, caoutchouc, cardamoms, coffee, tea, dyewoods, &c. The annual production of raw silk is about 660,000 lb. Cattle rearing is pursued. Coal, iron, and a little copper, zinc, and gold are worked.

**Shipping.**—The chief town is Hué, and the open ports are Turane, Qui-Nhon, and Xuan Day. No railways, the chief means of communication being by water. For trade, see **Cochin-China.**

**Antigua (St. John),** seaport and coaling station, West Indies. Lat. 17° 6′ N.; long. 61° 45′ W.; 3547 miles from Southampton.

**Port Accommodation.**—Good anchorage inside and outside harbour. Depth on bar at high water, 18½ ft.; in port, 15 to 20 ft. Excellent service of lighters.

**Steam Communication.**—Royal Mail S.P. Co. from Southampton.

**Trade.**—Exports: sugar, rum, molasses, and pine-apples (1904), £119,716; imports: foodstuffs and general merchandise, £142,965.

**Antofagasta,** a port of Chile. Lat. 23° 43′ S.; long. 70° 25′ W.; 9346 miles from London, and 570 m. from Valparaiso. Pop. (1900), 19,482.

**Port Accommodation.**—Open roadstead; anchorage in 15 to 40 fathoms, on rocky and uneven bottom. Discharging by lighters.

**Steam Communication.**—Kosmos line from London, and P.S.N. from Liverpool.

**Trade.**—Exports are nitrate of soda, silver and copper ores, borax, &c.; imports: coal, machinery, textile goods, provisions, &c. Large transit trade by railway with Bolivia. Exports, £626,000; imports, £300,000. B. V.-C.

**Antwerp,** fortified port and coaling station in Belgium, on R. Scheldt, 50 miles from the sea. Lat. 51° 13′ N.; long. 4° 24′ E. Pop. (1900), 272,851.

**Port Accommodation.**—Excellent harbour with over 3½ m. of quays along the river, the bed of which has been dredged to a minimum depth of 26½ ft. alongside quays. Ample dock (10 dry) and warehouse accommodation. Operations have just been begun (1906) for straightening the river channel and adding largely to the dock and warehouse accommodation. When completed Antwerp will have some 154,207 ft. of quay walls. Railway and canal facilities.

**Steam Communication.**—G.S.N. from London; G. C. Rly. from Grimsby; Wilson line from Hull; Gibson from Leith, &c.

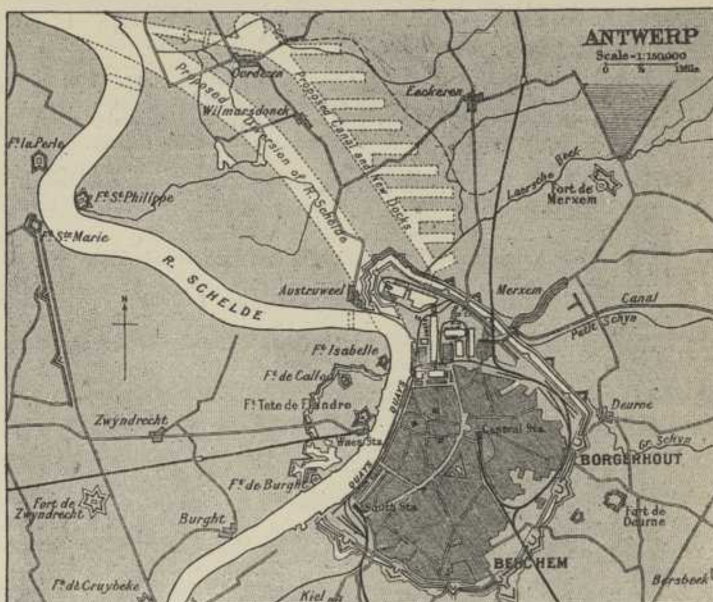
**Trade.**—Exports are grain, textiles, chemicals, coal, iron, glass, and manufactured goods (1904), £52,112,000; imports are coffee, coal, hides, grain, wool, petroleum, timber, &c., £80,400,000. British Consul-General.

**Apia,** port and coaling station on Upolu Island, Samoa. Lat. 13° 50′ S.; long. 171° 44′ W.; 13,846 miles from London *viâ* Suez. Pop. 3750.

**Port Accommodation.**—Open roadstead with sheltered anchorage in 5 to 7 fathoms.

**Steam Communication.**—American and Australian line from San Francisco.

**Trade.**—Exports, copra, &c., £101,400; imports, £144,100. B. C.




**Arabia.**—Area 1,200,000 sq. m. Pop. 3,500,000.

**Physical Features.**—Surface an elevated plateau, with arid, sandy plains in the S. and stony desert in the N.; mean elevation, 3500 ft.; hilly fertile tracts in Nejd, surrounded by desert; the most fertile, and only well-watered region is the mountainous Yemen in the SW.; Oman in the SE. is also hilly. Red Sea coast fringed with coral reefs; SE. coast elevated and rocky; along Persian Gulf generally low and flat.

**Climate.**—Extremely dry and hot, but varies greatly with altitude; at Yemen thermometer seldom rises above 90° F. even in July; mean at Sana, 85° F.; mean at Tehama, 98°; at Aden, 75° in Jan. and 85° F. in July. Scanty rainfall.

**Resources and Production.**—Millet or durra is cultivated for home consumption; cotton, maize, and rice are also grown; coffee and dates are largely grown and exported; other exports are senna, spices, balm, incense, &c. Horses, white donkeys, dromedaries, fat-tailed sheep, goats, and cattle are largely bred. There are important sponge fisheries off the coast, and diving for pearls is actively pursued in the Persian Gulf.

**Shipping.**—Principal ports are Aden, Jeddah, Hodeida, Maskat, and Basra.

**Archangel,** seaport of Russia, at mouth of N. Dvina into the White Sea. Lat. 64° 33′ N.; long. 40° 33′ E.; 750 miles NE. of St. Petersburg. Distance by sea from London, 2106 m.; from Leith, 1824 m. Pop. (1897), 20,933.

**Port Accommodation.**—The harbour occupies 12 m. of the river bank, and has been deepened from 12 to 22 ft. Dry dock and patent slipway. Connections by river, canals, and railway with the whole country.

**Trade.**—Exports are timber, wheat, oats, rye, linseed, flax, hemp, pitch, tar, oil, &c.; imports are coal and machinery, tea, coffee, spices, sugar, hardware, wines, fish, &c. B. V.-C.

**Argentine Republic.**—Area, 1,139,200 sq. m. Pop. (1903), 5,191,000.

**Physical Features.**—The surface of the country is for the greater part a vast plain sloping gently from E. to W., where it rises into the chain of the Andes. On the N. the plain is densely wooded, and in the rainy season swampy and insalubrious; the central pampas are wide expanses of treeless pasture, and in Patagonia the soil is largely stony desert, dotted with stunted bush. Some 45 per cent. of the lands is classed as waste, but suitable irrigation will change a large part of this into fertile soil. The principal rivers of the N. are the Paraná (with its tributaries—the Pilcomayo, Vermejo, and Salado) and the Uruguay, whose united waters debouch as the Rio de la Plata. South of these are the Colorado, Negro, Chubut, Santa Cruz, Deseado, and Chico, besides a number of other streams with inland drainage. Several fine lakes are found along the base of the Andes, including the beautiful Nahuel-huapi, Lake Viedma, and the Buenos Ayres. In other parts of the country are many smaller lakes and salt lagoons, including the Mar Chiquita, Laguna Ibera, and the Salina Grande.

**Climate.**—The mean annual temperature at Buenos Ayres is 63° F., rising to 67° at Tucuman, and 71° at Corrientes in the N., and falling to 56° at Rawson, on the Chubut, and to much lower readings in the colder parts of S. Patagonia. The rainfall diminishes from N. to S., and from W. to E. The mean annual precipitation at Buenos Ayres is 34 in.; at San Juan, 3 in.; at Mendoza, 8 in.; Rioja, 12 in.; Salta, 25 in.; Tucuman, 38 in.; Paraná, 38 in.; Rosario, 46 in., and Corrientes, 52 in.

**Resources and Production.**—Agriculture and stock-raising are the mainstay of the country, the cultivable area being capable of producing immense crops of cereals, and the grassy pampas affording pasture for all kinds of live stock. The area under cultivation in 1904-5 was fully 29,650,000 acres, yielding 4,130,000 tons of wheat, 3,480,000 tons of maize, and 920,000 of linseed. The acreage under wheat has been much increased in 1905-6. Sugar-cane is grown in Tucuman, tobacco chiefly in Corrientes and Salta, and vines in the north-western provinces. Lucerne or alfalfa is grown in all the provinces, and is much valued for pasture and forage. Cattle-ranching and sheep-farming are pursued on a very large scale, and a large export trade is done in animals and their products. In 1895 the number of animals within the Republic was given as: cattle, 21,701,526; horses, 4,446,859; mules, 483,369; sheep, 74,379,562, and pigs, 652,766. The forests of the sub-tropical districts produce excellent timber, suitable for railway sleepers, piles, building, and cabinet work, besides dyewoods and the *Quebracho colorado*, a hardwood now largely used in tanning, of which extract to the value of £485,500 was exported in 1905. Yerba maté, or Paraguay tea, is grown in the Misiones territory. The country is rich in minerals, but few of them are yet worked. Gold, silver, and copper are worked in Catamarca and San Juan. Other minerals found are galena, argentiferous lead, iron, bismuth, borate of lime, and salt. Coal is found at San Rafael in Mendoza, and lignite in Tierra del Fuego.

**Shipping and Railways.**—The merchant shipping in 1902 comprised 101 steamers of 38,770 tons net, and 151 sailing vessels of 38,071 tons net. The total length of railways open at the end of 1904 was 11,947 m.

**Exports and Imports.**—The total exports from the Republic in 1905 are valued at £64,659,000, and the total imports at £41,031,000. The United Kingdom took nearly 14 per cent. of the exports in value, and imported fully 33½ per cent. of the imports. The exports of frozen meat to the United Kingdom in that year exceeded for the first time those of the United States.

**Argostoli,** port in Cephalonia island, Greece. Lat. 38° 12′ N.; long. 20° 30′ E. Pop. (1896), 9241.

**Port Accommodation.**—No bar. Depth at loading place, 18 to 23 ft.; outside depth, 30 to 60 ft. Loading and discharging by lighters.
**Trade.**—Exports are currants and wine; imports are grain and other foodstuffs, cotton, woollen and linen fabrics, hardware, leather, &c. B. V.-C.

**Arica,** port of Chile. Lat. 18° 28′ S.; long. 70° 20′ W. Distance by sea from London *viâ* Magellan, 9654 miles. Pop. (1895), 2853.

**Port Accommodation.**—Open roadstead, with anchorage in 6 to 10 fathoms. Loading and discharging by lighters.
**Steam Communication.**—Kosmos line from London; P.S.N. from Panama.
**Trade.**—Largely a carrying one for Bolivia. Exports are copper, silver, sulphur, guano, wool, and skins. B. V.-C.

**Ashanti,** included in Gold Coast, *q.v.*

**Asia Minor.**—Area, 523,500 sq. m. Pop. 15,900,000.

**Physical Features.**—Surface a great plateau sloping from N. to S., with numerous volcanic mountain chains and lofty summits in Armenia; a central tableland, with the Taurus Mountains to the S., the plain of Mesopotamia, and the highlands of Syria, containing the Lebanon and Anti-Lebanon ranges. Principal rivers: the Kizil Irmak, Euphrates, and Tigris; principal lakes: the Dead Sea and Lake Van.
**Climate.**—Generally healthy in the highlands. Mean summer and winter temperatures at Trebizond, 72.5° and 48° F.; Smyrna, 78.8° and 48.5° F.; Jerusalem, 73.7° and 49.5° F.; Bagdad, 93° and 49.5°; S. and SW. coasts and islands generally mild winters, summer tempered by sea breezes.
**Resources and Production.**—Agriculture retarded by primitive methods of cultivation; the chief products of the soil are cereals of all kinds, tobacco, opium, cotton, madder, hemp, flax, &c.; fruits and the vine are cultivated in the maritime provinces and islands, and roses in the neighbourhood of Damascus. There is a large annual output of cocoons from the silkworms, and honey and wax from bees. The mineral wealth is great, but undeveloped; minerals partly worked are chromium, silver-lead, zinc, antimony, manganese, copper, borax, meerschaum (at Eskishehr), coal and lignite (Black Sea), petroleum, mercury, kaolin (Rhodes), arsenic, iron, and (Brusa) lithographic stones. Sponges are actively fished for off the coasts. The manufactures include silk, cotton, woollen fabrics, and carpets.
**Shipping and Railways.**—Principal ports: Alexandretta, Beirut, Basra, Haifa, Jaffa, Rhodes, Smyrna, and Trebizond. Length of railways open, 2186 m.
**Exports** and **Imports.**—*See* **Turkey** in Europe.

**Astoria,** port in Oregon, U.S., near mouth of Columbia R. Lat. 46° 16′ N.; long. 124° 3′ W. Pop. (1900), 8381.

**Port Accommodation.**—Harbour of 300 acres, 12 miles from the sea. Total length of wharfage, 1200 ft. Depth on bar at high water, 36 ft.; average depth alongside quays at low water, 22 ft.; high water, 7 ft. more.
**Trade.**—Exports: tinned salmon and oysters, lumber, &c. B. V.-C.

**Asuncion,** river port of Paraguay, on R. Paraguay. Lat. 25° 25′ S.; long. 57° 38′ W. Pop. (1900), 51,700.

**Steam Communication.**—With France by the Transports Maritimes.

**Athens.** *See* **Piræus.**

**Auckland,** seaport city and coaling station in N. Island, New Zealand. Lat. 36° 10′ S.; long. 174° 47′ E. Distance *viâ* Magellan Strait from London, 12,227 miles; from Sydney, 1264 m. Pop. (1901), 67,226.

**Port Accommodation.**—Spacious harbour, with 30 to 36 ft. depth at low water ordinary spring tides. Wharfage, 15,000 ft., of which 3700 ft. has a depth of 18 to 26 ft. alongside at low water.
**Steam Communication.**—N.Z.S. from London; Union Co. of New Zealand from Melbourne, Sydney, &c.
**Trade.**—Exports are frozen meat, fish, fruit, flax, wool, hides, tallow, kauri gum, gold, timber, &c.; imports consist of general merchandise, manufactured goods, &c. Total trade, £5,700,000.




**Austria-Hungary.**—Area, 241,197 sq. m. Pop. (1902), 46,406,000.

**Physical Features.**—About three-fourths of the surface is mountainous, the remainder mostly level plain. Chief rivers: the Danube, Dniester, Adige, Vistula, and Elbe; several large lakes.
**Climate** varies with altitude; mean temperature from 44° to 61° F.; rainfall, 18 to 65 in.
**Resources and Production.**—Area under corn crops, 41,373,000 acres; grass and other crops, 39,126,000 acres; woodland, 46,432,000. In 1903 the yield of corn crops in Austria was 329,598,000 bushels, and in Hungary 267,533,000 cwts. Among other produce in Austria-Hungary were potatoes, 14,510,000 tons; tobacco, 1,343,000 cwts.; wine, 147,703,000 gals.; sugar beetroots, 7,227,000 tons. The value of the mining products was £10,303,000 for Austria, and £2,531,000 for Hungary; value of Austrian fisheries (1903), £298,771.
**Shipping and Railways.**—Chief ports are Fiume, Spalato, and Trieste. Merchant fleet (1903), 250 steamers, of 262,409 tons, and 13,304 sailing vessels (including coasters and fishing vessels), of 51,724 tons. Vessels entered (1903), 122,056, of 15,491,604 tons; cleared, 122,025, of 15,498,63ʹ tons. Length of railways (1905), 25,958 m.
**Exports** of merchandise (1905), £90,337,000; to U.K., £7,190,359
**Imports**: £89,912,000; from U.K., £6,101,328.

**Aux Cayes,** seaport in Haiti. Lat. 18° 6′ N.; long. 73° 44′ W. Distance from Colon (Panama), 645 miles. Pop. 25,000

**Port Accommodation.**—Good anchorage. Depth at entrance, 40 to 50 ft.; in port, 30 to 40 ft. Wharf, 450 ft. long. Discharging by lighters.
**Steam Communication.**—Atlas and Ward Lines from New York; D.W.I.M. from Amsterdam.
**Trade.**—Exports are coffee, cocoa, and logwood; imports: cotton, provisions, wine, oil, and general goods. B. V.-C.

**Avonmouth.** *See* **Bristol.**

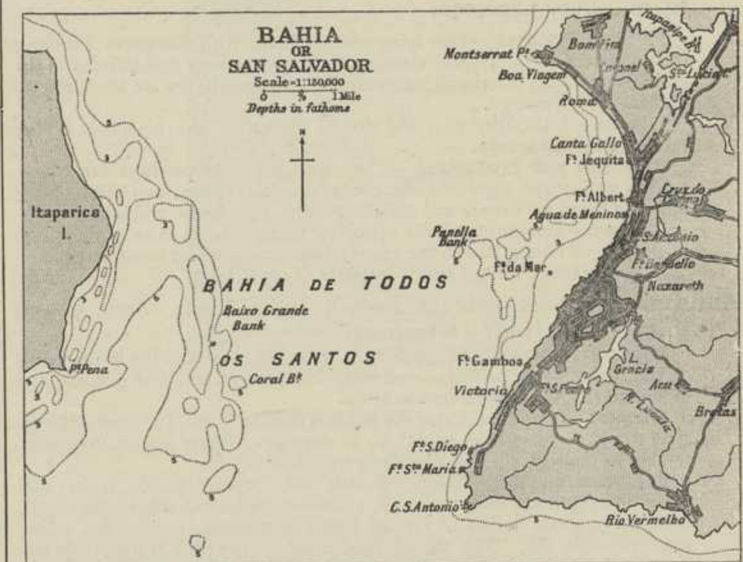
**Azores.** *See* **Flores, Fayal, St. Michael's.**

**Bahamas.** A group of islands in the West Indies in the possession of Great Britain. Area, 5450 sq. m. Pop. (1901), 53,800.

**Physical Features.**—Surface mostly limestone and shell, with a thin covering of vegetable mould.
**Climate.**—Healthy. Winter temperature (Nov. to May), 60° to 75° F., summer, 75° to 85°.
**Resources and Production.**—Fruits, vegetables, pine-apples, tomatoes, oranges, and cocoanuts are grown; 33,820 acres in 1904 were under sisal hemp. Sponge and turtle fisheries are carried on, and there is a trade in shells and ambergris.
**Shipping.**—Tonnage entered and cleared (1903), 1,123,887. Port is Nassau (New Providence).
**Exports,** sponges, pine-apples, sisal fibre (1905) £204,293; to U.K., £12,520. **Imports,** £291,953; from U.K., £62,978.

**Bahia,** seaport and coaling station, Brazil. Lat. 13° 0′ S.; long. 38° 30′ W.; 4526 miles by sea from London, and 710 m. from Rio de Janeiro. Pop. 200,000.

**Port Accommodation.**—Large vessels anchor in the bay, which has a depth from 6 to 24 fathoms; depth at berth from 4 to 10 fathoms.
**Steam Communication.**—R.M.S.P. Co. from Southampton; P.S.N. from Liverpool.
**Trade.**—Exports are cocoa, coffee, tobacco, hides, indiarubber, piassava, sugar, manganese, whale-oil, cotton, precious stones, &c. (1904), £2,869,000; imports: coal, iron, glass, fish, flour, salt, wines, &c., £1,544,000. B. C.




**Bahia Blanca,** seaport, Argentine Republic. Lat. 38° 47′ S.; long. 62° 15′ W.; 447 miles by rail SSW. of Buenos Ayres. Pop. 10,000.

**Port Accommodation.**—Fine harbour and moles. Depth on bar at high water (Port Belgrano), 22 ft.; in port, 30 ft.; depth at moles (Ingeniero White) at low water, 18 to 23 ft.; quayage, 5300 ft. Good railway facilities.
**Trade.**—Exports are wool, sheepskins, hair, and wheat; imports come through Buenos Ayres. B. V.-C.

**Baltimore,** seaport and coaling station, Maryland, on Patapsco R., 13 miles from its mouth in Chesapeake Bay. Lat. 39° 45′ N.; long. 76° 25′ W. Distance from Liverpool, 3338 m. Pop. (1900), 508,597.

**Port Accommodation.**—Tideless harbour, with good anchorage for largest vessels, and no bar. Depths at wharves from 20 to 30 ft. Great railway distributing centre.
**Steam Communication.**—Ham.-Am. line from Southampton; Puritan line from Antwerp, &c.
**Trade.**—Exports: wheat, flour, maize, cotton, tobacco, cattle, beef, hams, canned goods, oils, sheep, lumber, &c. (1905), £21,362,000; imports are coffee, iron, copper, tinplates, rice, fruits, salt, wines, chemicals, &c., £5,100,500. B. C.



**Baluchistan.**—Area, 131,855 sq. m. Pop. about 1,000,000.

**Physical Features.**—The surface is for the greater part made up of barren mountains, deserts, and stony plains.

**Climate.**—Subject to extremes of heat and cold, with uncertain and scanty rainfall.

**Resources and Production.**—Chief agricultural products are wheat, barley, millet, lucerne, poppy, rice, maize, and potatoes; dates, apricots, grapes, peaches, apples, and melons are also grown. The chief articles of commerce are mustard, rape, raw wool, and food grains sent to India in return for piece goods, ghi, fruits, hay, grass, &c. The trade with Persia and Afghanistan is imports of horses, ponies, dried fruits, &c., and exports of piece goods, indigo, sugar, and metals.

**Railways.**—Line to New Chaman in two branches; line to Nushki (82½ m.) under construction.

**Banana,** port on N. side of R. Congo, Congo State. Lat. 6° 1′ S.; long. 12° 17′ E.; 4830 miles from Antwerp.

**Port Accommodation.**—Depth on bar at low water, 17 ft.; in the anchorage, 26 ft.

**Steam Communication.**—Woermann line from Hamburg or Antwerp.

**Trade.**—Exports are ivory, rubber, palm-oil and nuts, gum, &c.; imports are textiles, arms and ammunition, tobacco and spirits.

**Bandholm,** seaport of Laaland, Denmark. Lat. 54° 50′ N.; long. 10° 26′ E.

**Port Accommodation.**—Outer harbour, with depth of 15 ft. at entrance and 9 ft. alongside quays. Quayage of inner harbour, 1250 ft.; depth alongside, 14½ to 15 ft. Railways on quays.

**Trade.**—Exports: grain, flour, dairy produce, wool, hides, cattle, sheep, and pigs; imports are coal, iron, manufactured goods, timber, salt, colonial produce, &c.

**Bangkok,** port and coaling station on the Menam, Siam. Lat. 13° 38′ N.; long. 100° 27′ E.; 805 miles from Singapore, and 9050 m. *viâ* Suez from London. Pop. 500,000.

**Port Accommodation.**—Owing to bar, with depth of 14 ft. at spring tides, only ships of 1500 tons can reach wharves. Three dry docks, with length of 710 ft.

**Trade.**—Exports: rice, paddy, teak, ebony, sapan-wood, spices, fish, gum, ivory, hides, &c. (1905), £5,989,100; imports: coal, coke, iron, textile fabrics, hardware, machinery, &c., £3,993,635. B. C.

**Barbados (Bridgetown),** a British West India island and naval coaling station. Lat. 13° 5′ N.; long. 59° 41′ W.; 3622 miles from Southampton, and 1040 m. from Kingston (Jamaica). Pop. 192,000.

**Port Accommodation.**—Depth on bar at high and low water, 15 and 13 ft.; quayage, 3495 ft.; depth alongside, 16 and 13 ft. Depths outside bar in Carlisle Bay, 7 to 18 fathoms.

**Steam Communication.**—R.M.S.P. from Southampton; and West India and Pacific line from Liverpool.

**Trade.**—Exports: sugar, molasses, rum, hides, tamarinds, aloes, &c. (1905), £696,830; to U.K., £124,523; imports: coal, machinery, manures, rice, coffee, timber, &c., £1,042,562; from U.K., £445,455.

**Barcelona,** seaport and coaling station of NE. Spain. Lat. 41° 23′ N.; long. 2° 11′ E.; 440 miles by rail from Madrid, and 1825 m. from London by sea. Pop. (1900), 533,000.

**Port Accommodation.**—Depth at entrance to harbour, 53 ft.; in inner harbour, 26½ ft. Total quayage, 10,122 ft. Railways to all parts of Spain.

**Steam Communication.**—Spanish line from London; C.T. from Liverpool.

**Trade.**—Exports: chiefly almonds, nuts, fruits, vegetables, soap, wines, woollens, cottons, paper, ribbons, lace, hats, &c.; imports: coal, cotton, coffee, colonial produce, wheat, flour, &c. B. C.




**Bari,** seaport of Italy on the Adriatic. Lat. 41° 8′ N.; long. 16° 55′ E.; 69 miles by rail NW. of Brindisi. Pop. (1901), 78,341.

**Port Accommodation.**—Harbour sheltered by breakwater; quayage, 4396 ft.; average depth of channel, 25.4 ft. Large vessels lie at the mole; quayage, 2841 ft. Good anchorage.

**Steam Communication.**—Florio Rubattino from Venice.

**Trade.**—Exports: wine, olive-oil, citrons, figs, tartar, soap, hides, &c.; imports: coal, cottons, woollens, yarns, tobacco, iron, petroleum, grain, &c. B. V.-C.

**Barranquilla,** port at head of navigation on the Magdalena, Colombia, 15 miles from the sea. Lat. 10° 56′ N.; long. 74° 51′ W. Pop. 40,000.

**Port Accommodation.**—No bar in river; good harbour; dry dock and two slipways. Large vessels discharge at **Savanilla,** *q.v.*

**Trade.**—Exports: gold, silver ore, hides, rubber, coffee, cattle, tobacco, balsam, &c.; imports: cottons, provisions, petroleum, salt, wines, &c. B. V.-C.

**Barrow-in-Furness,** seaport in NW. Lancashire, opposite Walney. Lat. 54° 4′ N.; long. 3° 10′ W. Pop. (1901), 57,584.

**Port Accommodation.**—Good harbour and docks, with depths up to 31½ ft. at high water of ordinary spring tides.

**Trade.**—Chiefly shipbuilding and engineering. Exports: iron ore, pig-iron, and steel rails (1905), £403,000; imports: grain, timber, pig-iron, general merchandise, £739,000.

**Basra.** *See* **Bussorah.**

**Bassein,** a port of Burma, on the W. branch of the Irrawaddy, 70 miles from its mouth. Lat. 19° 49′ N.; long. 72° 30′ E.; 7871 miles from London *viâ* Suez. Pop. (1901), 115,021.

**Port Accommodation.**—Good anchorage in from 21 ft. at low water to 30 ft. at high water according to season.

**Trade.**—Exports, rice; imports, coal and salt.

**Batavia,** seaport and coaling station in Java. Lat. 6° 8′ S.; long. 106° 8′ E.; 8511 miles *viâ* Suez from London, and 532 m. from Singapore. Pop. (1896), 115,567.

**Port Accommodation.**—Anchorage for large vessels in 5 to 6 fathoms a mile from pierhead. New harbour at **Tandjong Priok,** 4 m. NE., with 5500 ft. quayage and depths of 28 and 24 ft. at ordinary spring and neap tides.

**Steam Communication.**—B.I.S.N. from London; Ned. S. from Southampton.

**Trade.**—Exports: coffee, rice, sugar, spices, indigo, hides, teak, tin, tamarinds, &c.; imports: coal, machinery, opium; manufactured goods, iron, petroleum, &c. B. C.

**Bathurst,** port on estuary of the Gambia, W. Africa. Lat. 13° 28′ N.; long. 16° 34′ W.; 2566 miles from Liverpool. Pop. about 7000.

**Port Accommodation.**—Good anchorage. Depth at entrance at high water, 30 to 33 ft.; at Government wharf, 23 ft. and 17 ft. at low water.

**Steam Communication.**—Elder-Dempster from Liverpool; Woermann from Hamburg.

**Trade.**—Exports are ivory, gold, tortoise-shell, palm-oil, ground-nuts, gum, wax, hides, cotton, &c.; imports are cotton fabrics, salt, rice, hardware, ammunition, &c. *See* **Gambia.**

**Batum,** seaport and coaling station of Russia, on the Black Sea. Lat. 41° 40′ N.; long. 41° 39′ E.; 227 miles by rail from Tiflis; distance by sea from London, 3693 m.; from Constantinople, 582 m. Pop. 26,417.

**Port Accommodation.**—Sheltered harbour, with depths from 22 to 30 ft. No docks. Breakwater with 23 ft. depth alongside, for petroleum steamers.

**Steam Communication.**—Florio Rubattino from Genoa, Naples, and Venice.

**Trade.**—Exports: petroleum, manganese, walnut wood, liquorice, wool, &c. (1904), £5,442,600; imports: iron tank plates and pipes, tin, firebricks, cement, timber, machinery, copper, lead, spelter, &c. B. C.

**Bayonne,** seaport of France, on the Adour, 3 miles from the Bay of Biscay. Lat. 43° 29′ N.; long. 1° 28′ W. Pop. (1900), 32,722.

**Port Accommodation.**—Good harbour, with 18 to 21 ft. at high water of ordinary neap and spring tides. Quayage, 8758 ft.

**Trade.**—Exports: wood, resin, turpentine, cast-iron, skates, zinc, and steel; imports: coal, pottery, phosphates, sugar, grain, flour, pitch, &c. B. V.-C.

**Beira,** a seaport of Portuguese E. Africa. Lat. 19° 50′ S.; long. 34° 50′ E.; 7216 miles *viâ* Suez from London. Pop. (1900), 3379.

**Port Accommodation.**—Large tidal harbour. R. Pungwe navigable, but full of sandbanks and shallows.

**Steam Communication.**—U.C. and Natal line from London; D.O.A.L. from Hamburg.

**Trade.**—Exports are beeswax, ivory, rubber, sugar, hides, skins, &c. (1903), £57,621; imports: cotton and dry goods, sugar, beer, spirits, galvanised iron, tea, flour, preserves, timber, &c. (1903), £498,799, of which £237,750 were goods in transit to British territory. B. C.

**Beirut,** seaport and coaling station in Asiatic Turkey, on Mediterranean. Lat. 33° 54′ N.; long. 35° 26′ E.; 3327 miles from London, and 337 m. from Alexandria. Pop. 140,000.

**Port Accommodation.**—Harbour tideless, with no bar; water area, 24 acres; depth at entrance, 42 ft. 3 in., shallowing to 9 ft. 9 in. Steamers anchor outside, discharging by lighters. Railway to Damascus.

**Steam Communication.**—Papayanni line from Liverpool; Prince line from Manchester.

**Trade.**—Largely a distributive one, Beirut being the port for Damascus and other parts of Syria. Exports: silks, oil, wood, gall-nuts, gums, fruits, &c. (1904), £953,500; imports: coal, iron, tin, timber, rice, textiles, and other manufactured goods, £1,426,000. British Consul-General.

**Belfast,** seaport and coaling station of cos. Antrim and Down, at head of Belfast Lough. Lat. 54° 42′ N.; long. 5° 55′ W.;



113 miles by rail NW. of Dublin, 135 m. from Glasgow, and 156 m. from Liverpool. Pop. (1901), 349,180.

**Port Accommodation.**—Harbour safe and easily accessible; area of docks and basin about 134 acres; quayage, 24,642 ft.; depths from 12 ft. 9 in. at lowest neaps to 39 ft. 4 in. at highest spring tides; 4 graving docks. Railway connections to every part of Ireland.

**Steam Communication.**—Regular sailings to Glasgow, Ardrossan, Stranraer, Barrow-in-Furness, Liverpool, Dublin, &c.

**Trade.**—Exports are linen, provisions, aerated waters, iron ore, hides, whisky, yarn, pigs, &c. (1905), £1,780,768; imports are coal, cotton, flax, grain, flour, timber, machinery, &c., £6,671,974.

**Belgium.**—Area, 11,370 sq. m. Pop. (1904), 7,075,000.

**Physical Features.**—Surface mainly flat or slightly undulating; hilly in the S. and SW., rising to over 2000 ft. in the wooded Ardennes; in the W. protected by dams and dykes against the sea. Drained by the Scheldt and Maas, and their tributaries.

**Climate.**—Mean annual temperature is 50½° F. (Jan. 37°, July 60°). Rainfall, 28 inches.

**Resources and Production.**—Agriculture, mining, and manufactures are the main resources. 65.06 per cent. of the total area is under cultivation, 17.7 per cent. under forest, 5.75 per cent. uncultivated, the rest being roads, marshes, rivers, &c. In 1903 the different crops yielded: corn of all kinds, 35,012,532 cwts.; potatoes, 2,318,462 tons; sugar beetroot, 1,434,904 tons; tobacco, 86,446 cwts. Output of coal (1905), 22,492,000 tons; iron ore (1903), 184,400 tons. Total value of minerals extracted, £14,075,000. Value of fish caught (1904), £2,391,000.

**Shipping and Railways.**—Chief ports, Antwerp and Ostend, *q.v.* The merchant fleet (1904) numbers 69 vessels (65 steamers), of 102,737 tons. Vessels entered (1904), 9063, of 11,176,239 tons; cleared, 9056, of 11,144,849 tons. Length of railways open, 2830 miles.

**Total Exports** (1905), £93,348,000. **Total Imports** (1905), £122,732,000; for home consumption, £115,408,000. Exports to U.K., £14,652,280 (woollen and linen yarn, flax, silk, sugar, iron and steel manufactures, machinery, embroidery, &c.). Imports from U.K., £15,652,280 (textiles, machinery, iron, ships, &c.).

**Belize,** seaport and coaling station in British Honduras. Lat. 17° 29′ N.; long. 88° 12′ W.; 4992 miles from London, 665 m. from Kingston (Jamaica). Pop. (1900), 9075.

**Port Accommodation.**—Anchorage outside the shallow harbour; depth at high water, 20 to 25 ft. Loading and discharging by lighters.

**Steam Communication.**—Central America Co. from New York.

**Trade.**—Exports are mahogany, cedar, rosewood, logwood, cocoanuts, skins, sugar, sponges, fruit, rum, &c.; imports are foodstuffs, cottons, hardware, tobacco, &c.

**Bender Abbas.** *See* **Bunder Abbas.**

**Benguella,** seaport of Angola, Portuguese W. Africa. Lat. 12° 34′ S.; long. 13° 25′ E.; 5028 miles from London. Pop. 3000.

**Port Accommodation.**—Exposed anchorage in 4 to 6 fathoms one mile from the town.

**Trade.**—Exports are amber, ivory, wax, skins, gold, and copper. Total trade, £1,158,300 (1905). B. V.-C.

**Benin,** a port of S. Nigeria. Lat. 5° 46′ N.; long. 5° 3′ E.

**Port Accommodation.**—Depth on river bar, 9 ft., and in channel, 12 to 17 ft. Anchorage in roadstead 3 m. off shore.

**Steam Communication.**—Elder-Dempster line from Liverpool.

**Trade.**—Exports: palm-oil and kernels; imports: general goods.

**Berbera,** a port on Gulf of Aden, Somaliland. Lat. 10° 25′ N.; long. 45° 5′ E.

**Port Accommodation.**—Good harbour and dock, with 12 fathoms water at entrance, shoaling to 5 fathoms.

**Trade.**—Exports are gum, resin, skins, ostrich feathers, sheep, goats, clarified butter, &c.; imports: cotton, rice, Indian piece goods, American grey shirting, &c.

**Berbice (New Amsterdam),** port of British Guiana, on Berbice R. Lat. 6° 14′ N.; long. 57° 31′ W.; 4089 miles from London. Pop. 50,000.

**Port Accommodation.**—Depth on bar at high water ordinary neap and spring tides, 9 ft. and 16 ft. Loading and discharging by lighters, or at private wharves.

**Steam Communication.**—Demerara, Berbice, and "Direct" line from London.

**Trade.**—Exports: sugar, coffee, rum, hides, and timber; imports: groceries, &c.

**Bergen,** fortified seaport and coaling station in Norway. Lat. 60° 24′ N.; long. 5° 18′ E.; 410 miles from Newcastle-on-Tyne, and 388 m. from Leith. Pop. (1900), 72,179.

**Port Accommodation.**—Commodious harbour, with 33 to 54 ft. water; quayage, 4147 ft., with 8 to 37 ft. depth alongside, besides smaller quays, with depths of 4½ ft. to 10½ ft. Three dry docks.

**Steam Communication.**—Regular sailings from Hull (Wilson line), Newcastle, and Leith.

**Trade.**—Exports: cod-fish, cod-oil, cod-roes, herrings, bones, minerals, &c. (1904), £1,299,300; imports: grain, coal, iron, hardware, salt, and general merchandise, £2,882,400. B. V.-C.

**Bermudas,** island group belonging to Gt. Britain, port (Hamilton), naval coaling station (Ireland), in the Atlantic. Lat. 32° 15′ N.; long. 64° 52′ E.; 3166 miles from London; 699 m. from New York, and 1168 m. from Kingston. Pop. (1901), 17,535.

**Port Accommodation.**—The port of Hamilton is 3 m. long by ½ m. wide; quayage, 16,000 ft.; depths alongside at high and low water, 13 and 9 ft.; depths for vessels entering port, 22 and 18 ft. Depths of high water at St. George's, 18 and 20 ft. Large floating dock at Sheerness.

**Trade.**—Exports: potatoes, onions, tomatoes, beetroot, arrowroot, bulbs, hides, and tallow (1905), £116,428; imports: provisions and general goods, £543,222.

**Bhutan.**—Independent state in E. Himalaya. Area, 16,800 sq. m. Pop. 25,000.

**Physical Features.**—High mountain, plain, and valley; watered by tributaries of the Brahmaputra.

**Climate.**—Alpine, with temperature according to elevation, rainfall abundant.

**Resources and Productions.**—Manufactures of coarse woollen and cotton goods, and tanned buffalo leather. Exports: horses, cattle, fruits, ghi, wax, and piece goods to Bengal and Assam, whence are imported manufactured goods, rice, grain, tobacco, sugar, spices, silk, brass, copper, iron, and metal wares.

**Bilbao,** port and coaling station on R. Nervion, in N. of Spain. Lat. 43° 14′ N.; long. 3° 3′ W.; 712 miles from London, and 808 m. from Glasgow. Pop. (1900), 83,306.

**Port Accommodation.**—Depths on bar at high water, ordinary springs and neaps, 22 and 19 ft.; in port at ordinary springs, 24 ft. (high water), and 14 ft. (low water). Quayage available, 10,437 ft., with depths from 10 to 28 ft. Good anchorage for largest vessels in outer harbour in 13 to 42 ft.

**Steam Communication.**—Spanish line from London.

**Trade.**—Exports: iron ore (chiefly to U.K.), pig-iron, wine, fruits, &c.; imports are coal and coke, machinery, railway plant, textile goods, petroleum, &c. B. C.

**Birkenhead.** *See* **Liverpool.**

**Bissao,** fortified port on estuary of R. Geba, Portuguese Guinea. Lat. 11° 52′ N.; long. 15° 44′ W.

**Port Accommodation.**—Well-sheltered roadstead, with depth sufficient for largest vessels.

**Steam Communication.**—Woermann line from Hamburg.

**Trade.**—Exports are hides, wax, ivory, gum, rice, wood, &c.; imports: cotton goods, salt, gunpowder, hardware.

**Bizerta,** seaport and French naval station of Tunis. Lat. 37° 15′ N.; long. 9° 52′ E.; 60 miles by rail NW. of Tunis, and 422 m. from Marseilles. Pop. 10,000.

**Port Accommodation.**—Outer harbour, protected by two jetties 3000 ft. long, and connected with the Lake of Bizerta by a canal 30 ft. deep; stone quays, with 26 ft. water alongside.

**Trade.**—Exports, chiefly fish.

**Bluff Harbour,** port of S. Island, New Zealand. Lat. 46° 36′ S.; long. 168° 22′ E.; 17 miles from Invercargill. Pop. (1901), 1345.

**Port Accommodation.**—Depth in harbour at high water ordinary spring tides, 24 to 30 ft.; wharfage, 1760 ft.; depths alongside, 24 to 35 ft.

**Trade.**—Exports: wool, hides, tallow, tinned meats; imports: coal, timber, guano, &c.

**Blyth,** port and coaling station in Northumberland, at the mouth of the R. Blyth.

**Port Accommodation.**—Depth at entrance, 24 to 28 ft. at high water. Quayage, 10,000 ft., with depth alongside of 29 to 38 ft. South harbour, 23 acres, with depths of 30 to 38 ft. at high water.

**Trade.**—Exports: chiefly coal, £1,461,000 (1905); imports: chiefly wood, £33,600.

**Bolivia.**—Area, 703,600 sq. m. Pop. (1904), 2,182,000.

**Physical Features.**—In general the country is characterised by deep valleys to the north, vast plains to the east, and a range of steep mountains to the west, surrounding a lofty plateau 10,000 to 12,000 ft. above the sea, with an extreme length of 520 m. and a breadth of 80 m., and containing two large lakes. The fertile region in the east consists of rolling plains, with rich pastures and well-wooded lands, irrigated by the large rivers flowing towards the NE. and SW. The plateaus of the S. are arid and salt-impregnated, and the climate cold; towards the SW. is a belt of sandy plains. The rivers flowing from the W., E., and S. slopes of the Andes empty into the great Titicaca Lake, which has an area of about 3220 sq. m., and is drained by the Desaguadero into Lake Poopo. Navigable rivers in the Amazon region are the Madeira, Beni, Acre, Mamore, and Madre de Dios. Many of the rivers are subject to heavy flooding from November to March.

**Climate.**—The country is divided into three distinct climatic zones, according to altitude. The *yungas* region, from sea-level to 5540 ft., has a mean annual temperature from 71.6° to 66.2° F.; the *valle* region, from 5540 ft. to 10,035 ft., ranges from 66.2° to 57.2° F.; and the *puna* region, from 10,035 ft. to 15,725 ft., varies between 57.2° and 35.6° F., according to elevation. In the *yungas* there is no winter, humidity is constant, and rainfall abundant; in the valleys rain lasts from November to March; in the *puna* the atmosphere is dry and cold, and in the higher parts precipitation is only in the shape of snow or hail. Violent electrical storms are frequent.

**Resources and Production.**—About 2½ million acres are available for agriculture, which, however, is in a backward condition, and its products are mainly used for local consumption. Corn, wheat, barley, beans, and potatoes are grown on the plateau. Coca, coffee, and cinchona are cultivated in the *yungas* and on the E. slopes of the Andes. The total production of coca is estimated at £7,700,000 lb. Rubber forms the most valuable of the exports; in 1903 the exports amounted to 1321 metric tons. Sugar is produced in the department of Santa Cruz, and is used chiefly for distillation purposes. The forest products include ebony, mahogany, cedar, rosewood, satinwood, walnut, and building timbers. The country is peculiarly suited for stock breeding, and although large herds of wild and domesticated cattle are found in the valleys and tablelands, stock raising is still in its infancy. Much sun-dried beef, known as *charque* and *cecina*, is prepared in the numerous salting establishments. Sheep's wool and skins of fine quality, and goat-skins are exported. Chinchilla fur commands good prices, while the wool of the alpaca, vicuña, and llama are exported. Bolivia is exceedingly rich in minerals, and mining is the chief industry of the country; it is, however, much hampered by the lack of rapid means of communication, labour, and capital. Silver, gold, copper, tin, bismuth, lead, borax, antimony, wolfram, zinc, and cobalt, are among the metals worked. The value of the minerals extracted in 1903 was £1,995,000, tin, silver, and copper accounting for most of this sum.

**Shipping and Railways.**—Having no sea-board, most of the foreign trade is done through the Peruvian port of Mollendo, the Chilian ports of Antofagasta and Arica, and the E. ports of Villa Bella and Puerto Suarez. The total length of railways open is about 700 m., but other lines are under construction or in contemplation.

**Exports.**—Chiefly silver, tin, and rubber, £1,952,000 (1904). **Imports.**—Provisions, hardwares, cotton, woollen, linen and silken goods, and clothing, £1,734,000.

**Boma,** port, Congo State, on R. Congo, about 45 miles from its mouth. Lat. 18° 55′ N.; long. 72° 53′ E.

**Port Accommodation.**—Depth of water varies from 20 to 66 ft.; depth from Boma to the sea, 17 ft.

**Steam Communication.**—Woermann line from Hamburg and Antwerp.

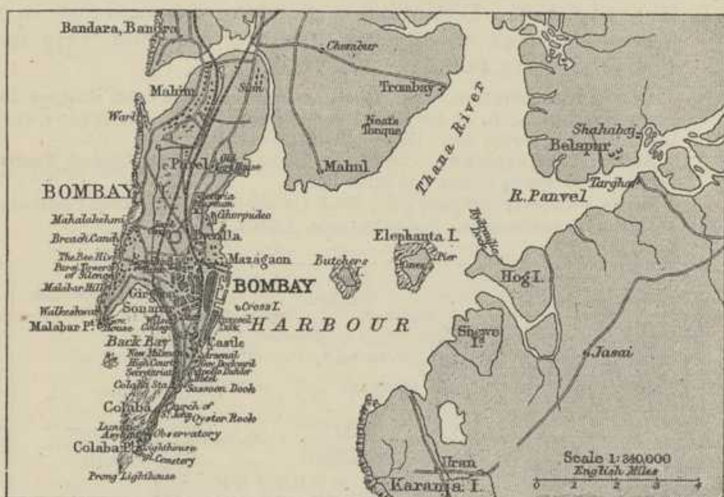
**Trade.**—Exports: ivory, palm-oil and nuts, rubber, gum; imports: general goods.

**Bombay,** seaport and naval coaling station, India. Lat. 18° 54′ N.; long. 72° 49′ E.; 6260 miles *viâ* Suez from London; 1664 m. from Aden; 483 m. from Karachi; 2114 m. by sea and 1100 by rail from Calcutta. Pop. (1901), 776,006.

**Port Accommodation.**—Harbour, 12 to 14 m. long; water area of docks, 75 acres; quayage, 15,200 ft.; high water depths from 23 to 30 ft. Dry docks. New dock scheme now in progress, to be completed in 1911. Ample railway facilities.

**Steam Communication.**—From London by P. and O. and B.I.S.N.; Liverpool, Anchor, City, and Hall lines; Marseilles, M.M.; Genoa, Naples or Venice, Rub.

**Trade.**—Exports include cotton, coffee, opium, wheat, seeds, drugs, dye-stuffs, gums, carpets, rugs, hides, &c.; imports include coal, machinery, metals, hardware, haberdashery, textile fabrics, chemicals, and general merchandise. Total value of trade, £51,406,000 (1904–5).




**Bona,** a seaport of Algeria. Lat. 36° 54′ N.; long. 7° 46′ E.; 402 miles from Marseilles, and 1958 m. from London. Pop. (1901), 36,993.

**Port Accommodation.**—Fine harbour in course of extension, with a depth of 22½ ft. at quays, and a minimum of 30 ft. off the quays.

**Trade.**—Exports are iron, copper, lead, zinc, esparto, phosphates, cork, tannin, &c.; imports, general merchandise. B. V.-C.

**Bordeaux,** port and coaling station, France, on R. Garonne, 60 miles from its mouth. Lat. 44° 50′ N.; long. 0° 34′ W.; 360 m. by rail SW. of Paris; 682 m. from London by sea. Pop. (1901), 256,638.

**Port Accommodation.**—Length of quays, 17,382 ft. Depth in dock from 20½ at lowest neaps to 29½ ft. at highest springs; depth at river quayage at high water, 32.8 to 39.4 ft.; low water, 19.7 ft.

**Steam Communication.**—G.S.N. from London; Moss line from Liverpool.

**Trade.**—Exports are wines, brandies, fruits, sugar, coffee, gums, oil, rags, porcelain, glass, straw envelopes, &c. (1904), £13,263,000; imports are coal, coke, coal tar, chemicals, pure oils, wool, raw cotton, hides, beer, spirits, colonial produce, hardware, machinery, &c., £11,455,000. B. C.




**Borneo.**—Area, 300,740 sq. m. Pop. 1,910,000. British N. Borneo, area (with Sarawak and Brunei), 88,000 sq. m.; pop. 810,000. Dutch Borneo, area 212,737 sq. m.; pop. 1,129,889.

**Physical Features.**—Traversed by a mountain chain forming the water-shed from NNE. to SSW., with ranges striking off to the E., S., and SW.; highest point, Kinabulu, 13,698 ft. Chief rivers, the Kapuas, Kinabatangan, and Barito. Coast low-lying, with swamps at lagoons at the mouths of the rivers. Forests in the interior.

**Climate.**—Hot and humid; temperature (average), N. Borneo, 95° F.; S. Borneo, 82° F.; rainfall heavy.

**Resources and Production.**—Rice, sugar-cane, sago, tapioca, coffee, earth-nuts, indigo, maize, hemp, cotton, and tobacco are grown and exported; the forests produce sandal-wood, teak, ironwood, ebony, india-rubber, damar, camphor, pepper, cloves, nutmeg, ginger, cinnamon, betel-nuts, gambier, rattans, fibres, &c.; coal, iron, gold, antimony, quicksilver, platinum, and diamonds are found. Edible birds' nests are exported to China, and tripang, pearls, and tortoise-shell are got off the coasts.

**Trade.**—British N. Borneo (1905): exports, £425,400; imports, £266,000.

**Bosnia and Herzegovina.**—Provinces of Turkey, administered by Austria-Hungary. Area, 19,700 sq. m. Pop. (1900), 1,737,000.

**Physical Features.**—Surface mountainous, with well-wooded valleys, and watered by the Save, Bosna, Drina, Una, Verbas, &c.

**Climate.**—Temperate and moist, with cold winters; mean temperature at Serajero, 48° F. (Feb. 29½°, and July 67½°).

**Resources and Production.**—Fifty-two per cent. of the surface is under forests (lime, beech, pine, and larch). Maize, wheat, barley, oats, rye, millet, buck-wheat, potatoes, flax, and hemp are cultivated; fruit largely grown; dried plums and marmalade exported; the vine, sugar-beet, and silk are also cultivated. Minerals abound; chromium, iron, copper, manganese, quicksilver, and coal are worked.

**Railways.**—Open, 679 m.

**Exports** (1904), £3,896,000. **Imports,** £3,826,000.

**Boston,** seaport and U.S. coaling and naval station, Massachusetts, at the mouth of the Charles and Mystic rivers. Lat. 42° 19′ N.; long. 70° 45′ W.; 379 miles by sea from New York; 2717 m. to Glasgow; 2854 m. to Liverpool; 3088 m. to London. Pop. (1900), 560,892.

**Port Accommodation.**—Extensive harbour, with good anchorage for vessels of any size. Mean low water in channel inward from sea, 28 ft.; mean high water, 37½ ft; depth in channel inward from quarantine station, at low water, 27 ft.; at high water, 36½ ft. Water frontage lined with wharves and docks, 12 m., dredged to depths varying from 29 to 32 ft. Dry docks, grain and coal elevators.

**Steam Communication.**—Allan and State line from Glasgow; Cunard and others from Liverpool; Wilson and Furness-Leylands from London; Puritan from Antwerp; Ham.-Am. from Hamburg, &c.

**Trade.**—Exports: live cattle, provisions, cotton goods, leather goods, wood manufactures, iron and steel manufactures, &c. (1905), £19,160,500; imports: coal, cotton, fruit, fish, and general commodities, £21,875,000. B. C.




**Bougie,** a fortified port of Algeria. Lat. 36° 44′ N.; long. 5° 4′ E.; 395 miles from Marseilles. Pop. (1901), 14,552.

**Port Accommodation.**—Good anchorage for vessels of any size. Depth of water within the breakwater, 22½ ft. Facilities for discharging all kinds of merchandise.

**Trade.**—Exports: olive-oil, figs, wool, hides, and coral.

**Boulogne-sur-Mer,** seaport and chief fishing station in N. of France at mouth of R. Liane in English Channel. Lat. 50° 44′ N.; long. 1° 36′ E.; 157 miles NNW. of Paris; 26 m. from Folkestone; and 105 m. from London. Pop. (1901), 49,949.

**Port Accommodation.**—Outer harbour sheltered by a breakwater and Cape Grisnez, with depths in channel of 27 ft. 5 in. at low water to 59½ ft. at high water of highest springs. Quayage of avant-port, tidal harbour, and wet dock, 9176 ft.; depths alongside from 14 to 43 ft. at high water spring tides.

**Steam Communication.**—G.S.N. from London; New Palace from Tilbury, &c.

**Trade.**—Exports are eggs, poultry, fruit, vegetables, dried fish, wine, watches, tools, leather, textiles, fancy goods, &c.; imports are coal, wood, textiles, pork, salt, &c. B. V.-C.

**Braila,** port and coaling station of Roumania, on the Danube. Lat. 45° 17′ N.; long. 27° 58′ E.; 142 miles by rail NE. of Bucharest. Distance from Constantinople by sea, 360 m.; from London, 3468 m. Pop. (1899), 58,392.

**Port Accommodation.**—Vessels drawing 24 ft. can reach quay (6435 ft.) alongside river. Basin water area, 20 acres; quayage, 1830 ft.; depth at entrance and at quayside varies from 42 ft. 7 in. in May and June to 15 ft. in October and November.

**Steam Communication.**—Florio Rubattino from Naples, &c.

**Trade.**—Exports: grain, tallow, flour, and cattle; imports: coal, iron, agricultural machinery, woollen goods, and general merchandise. B. V.-C.

**Brazil (Republica dos Estados Unidos do Brazil).**—The Republic of the United States of Brazil is by far the largest self-governing country of South America, and embraces nearly one half of that continent. In point of area it ranks fifth among the great empires and states of the world. Its boundaries towards the adjoining republics of Colombia and Peru have not yet been definitely fixed, but from recent planimetrical

calculations its area may be set down as about 3,293,000 sq. m.; its greatest length from N. to S. is 2660 m., and its greatest breadth, 2700 m. On the NE., E., and SE. it is washed by the Atlantic Ocean, and the length of its coast-line will not fall far short of 4400 m. The total population in 1903 was estimated at 16,000,000, of whom 1,500,000 were Italians, 1,000,000 Portuguese, 250,000 Germans, 4000 British, 400 Americans, and 20,000 other foreigners; the remainder is made up of native Indians (belonging to various tribes), metis, and negroes. In the southern states there are prosperous German and Italian colonies.

**Physical Features.**—The central and eastern part of the country forms a tableland of moderate height, traversed by several mountain chains, forming the watershed of the great rivers flowing to the south and north. The basin of the Amazon and its tributaries in the NW., and that of the Paraguay in the S., contain much low-lying swampy lands, covered with wood and jungle, and is of an insalubrious character. A great part of the interior of Brazil is still unexplored and unexploited. One of the most remarkable features of the country is the number and extent of its rivers. The Amazon and its tributaries drain one-half of the country, and pour a mighty volume of water into the Atlantic. The Paraguay and other rivers of the S. drain about one-fifth.

**Climate.**—Over so great a territory considerable differences of climate are necessarily found; but the mean temperature may be put at 63° F., and the rainfall at 50 to 90 inches. In general it is very warm on the plains, and humid along the river courses.

**Resources and Production.**—The vegetable and mineral wealth of Brazil is immense. In the hot, humid region of the Amazon the great tropical forests yield large quantities of rubber. The forests produce mahogany, logwood, rosewood, brazilwood, sarsaparilla, dyewoods, fibre-plants, nuts, mimosa, cinchona, and other drug plants, vanilla, &c. The cultivated products include coffee, cacao, sugar-cane, cotton, tobacco, maize, beans, cassava-root, indiarubber, herva matte (Paraguay tea), &c. Most of the coffee of the world comes from Brazil. Among minerals found are gold, silver, lead, zinc, iron, copper, manganese, diamonds, coal, monazite sand, &c. The value of the mineral products exported in 1904 was less than 2.4 per cent. of the total value of the exports.

**Railways and Shipping.**—Total length of railways open for traffic (1904), 10,408 m.; under construction, 4000 m. Merchant fleet (1901), 228 steamers, of 91,465 tons net, and 343 sailing vessels, of 76,992 tons net. Vessels entered (1903), 16,068, of 11,388,298 tons, of which 12,260, of 4,471,906 tons, were Brazilian.

**Imports and Exports.**—The chief articles of import are flour, wheat, rice, dried meat and fish, cotton goods, coal, and wine (1904), £25,896,000; and the exports the agricultural, mineral, and forest products of the country. Those include coffee, rubber, hides and skins, cocoa, yerba maté, tobacco, cotton, gold in bars, manganese, carnauba wax, monazite sand, para-nuts, sugar, bran, cotton-seed, lumber, precious stones, wool, fruits, manioc, cassava, piassava, horse-hair, extract of meat, &c., of a total value in 1905 of £44,642,983, of which nearly one-half represents coffee and nearly one-third rubber. Hides and skins, herva matte, cotton, and cocoa are also valuable exports.

The principal ports of Brazil are Ceará, Florianopolis, Itajahy, Laguna, Maceio, Maranhão, Natal, Para, Paranaguá, Parnahyba, Pernambuco, Porto Alegre, Rio Grande do Norte, Rio Grande do Sul, Rio de Janeiro, Santos, and São Francisco.

**Bremen,** free city, port and coaling station on the Weser, Germany. Lat. 53° 48′ N.; long. 8° 8′ E.; 72 m. by rail SW. of Hamburg. Pop. (1900), 163,297.

**Port Accommodation.**—Vessels drawing 20 ft. can go up to Bremen city. Three wet docks; quayage, 16,794 ft.; depths from 11½ ft. at low water to 22 ft. at high water. Three floating dry docks.

**Steam Communication.**—Nord-Deutscher Lloyd from London, Southampton, and Hull; Leith, Hull, and Hamburg line from Leith.

**Trade.**—Exports include woollens, linen, glass, wheat, rice, iron, and steelware, oil-cake, wooden toys, &c. (1904), £27,760,000; imports: coal, cotton goods, linen yarn, tobacco, machinery, colonial produce, &c., £47,000,000. B. V.-C.

**Bremerhaven,** the outport of Bremen, 29 miles farther down the R. Weser. Lat. 53° 33′ N.; long. 8° 33′ E. Distant from London, 379 m.; Hull, 337 m.; Leith, 440 m. Pop. 20,315.

**Port Accommodation.**—Four large docks, with 20,027 ft. of quayage, and high water depths from 15 ft. at lowest neap tides to 34 ft. at spring tides. Six dry docks.

**Trade.**—*See* Bremen. B. V.-C.

**Brest,** port and naval station in dep. Finistère, France. Lat. 48° 24′ N.; long. 4° 29′ W.; 390 miles by rail W. of Paris. Distant from London, 361 m.; 159 m. from Devonport; 236 m. from Southampton. Pop. (1901), 84,284.

**Port Accommodation.**—Tidal harbour, with 7580 ft. of quayage, and depths alongside of 24 ft. 8 in. at low water, and 52 ft. at high water. Two dry docks, two gridirons, a floating dock, and a pontoon.

**Trade.**—Exports: chiefly fruit, barley, potatoes, and vegetables (1905), £40,080; imports are coal, tar, cement, timber, manures, and wine, £244,180. B. C.




**Bridgetown.** *See* **Barbados.**

**Brindisi,** seaport and coaling station in SE. of Italy. Lat. 40° 39′ N.; long. 17° 59′ E.; 2593 miles by sea from London; 372 m. from Trieste; 382 m. from Venice; and 925 m. from Port Said. Pop. (1901), 23,106.

**Port Accommodation.**—Available for largest size of vessels. Total quayage, 5250 ft., with depths alongside from 7½ to 29½ ft. Three patent slips.

**Steam Communication.**—P. and O., and Rub. from Venice.

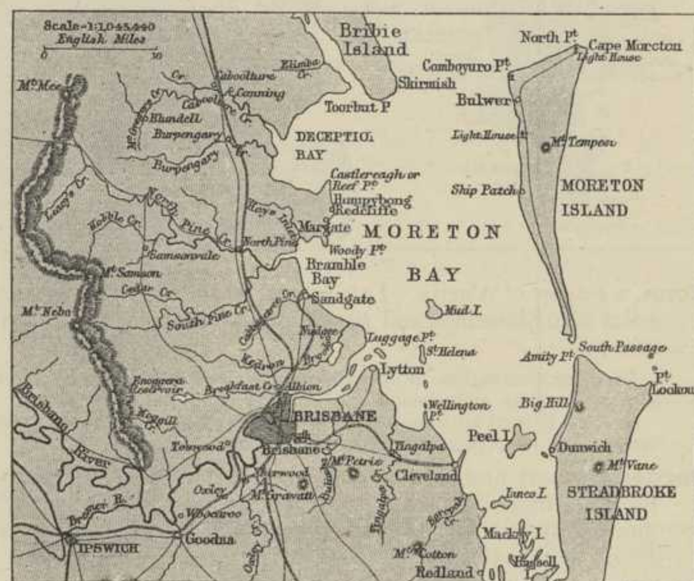
**Trade.**—Exports: olive-oil, wine, figs, almonds, tartars, silk waste, &c. (1904), £605,400; imports: coal, iron, petroleum, grain and flour, colonial goods, and animals, £545,800. B. C.

**Brisbane,** port and coaling station in Queensland, on Brisbane R., 25 miles from its mouth in Moreton Bay. Lat. 27° 28′ S.; long. 153° 7′ E. Distance from London *viâ* Suez, 11,961 m.; Vancouver, 6440 m.; Sydney, 474 m.; Auckland, 1335 m. Pop. (1901), 119,428.

**Port Accommodation.**—The Brisbane channels have been dredged to give a depth of 24 ft. at low water, and the largest vessels can enter and lie alongside the wharves. Dry dock and three slips.

**Steam Communication.**—British India from London; Nippon Yusen Kaisha from Southampton, and other lines.

**Trade.**—Exports comprise gold, wool, cotton, tallow, and hides; imports are general merchandise. Value of trade, £5,862,000.




**Bristol,** a port and coaling station of England, at junction of the Avon with the Severn, 6 miles from Avonmouth on the Bristol Channel. Lat. 51° 27′ N.; long. 2° 38′ W.; 117½ m. W. of London by rail. Pop. (1901), 329,366.

**Port Accommodation.**—Vessels of largest tonnage can enter Avonmouth dock at all hours; mean depth over sill at ordinary high water, 38 ft.; depths in other docks, 21 to 33 ft. Three dry docks, a gridiron, and patent slipway.

**Trade.**—Exports are salt, coal, tinplates, cottons, piece goods, chemicals, railway material, and machinery (1905), £2,685,000; imports include grain, provisions, oils, marbles, ores, fruits, tobacco leaf, petroleum, timber, &c., £12,091,000.

**British Central Africa Protectorate (Nyasaland).**—Area, 40,980 sq. m. Pop. (1904), 481 Europeans and 990,000 natives.

**Physical Features.**—A mountainous plateau, rising to 8000 ft., with valleys and plains, in the lakes region, drained by rivers flowing to Lake Nyasa, and in the S. by the Shiré flowing from the lake to the Zambesi. Highest peak, Mount Mlanje, 9683 ft.

**Climate.**—Healthy in the highlands; average rainfall, 40 in.; low-lying grounds infested with the tsetse fly.

**Resources and Production.**—Coffee is grown in the Shiré province—output (1903–4), 714,743 lb.; tobacco, cotton, rice, wheat, oats, and barley are the other products of the soil.

**Shipping and Railways.**—There are eight small steamers on Lake Nyasa, and five on the Upper Shiré, besides small sailing vessels; the river steamers of the A.L. Co., the B.C.A. Co., and the A.I.F. Co. meet ocean steamers at Chinde. Railway from Portuguese boundary to Blantyre now in progress; mono-rail between Blantyre and the Upper Shiré.

**Exports** (1905), £48,450. **Imports,** £220,700.

**British East Africa Protectorate.**—Area, about 200,000 sq. m. Pop. 4,000,000, including 25,000 Asiatics and 500 Europeans and Eurasians.

**Physical Features.**—A broad strip of lowland slopes upward from the coast to the high plateaus E. and NE. of Victoria Nyanza, with the lofty mountains, Kenia, Elgon, and Ruwenzori; on the NW. the land slopes downward to the Nile Basin. Contains many large lakes (Victoria, Albert, and Albert Edward Nyanza, Rudolf, Stefanie, &c.), and is watered by the upper course of the Nile, the rivers Tana, Juba, &c.

**Resources and Production.**—The country is only in process of development. In the lowlands, rice, maize, native grains, and some cotton and tobacco are grown; in the highlands, potatoes, coffee, wheat, and barley are cultivated, and the forests yield rubber, fibres, castor-oil beans, and contain croton, olive, fig, and good timber trees; the forests of the coast yield cocoanuts, rubber, gum copal, and timber; other products of the coast lands are mangroves, and acacia and ebony in the scrub forests. The mineral resources are almost unexploited; but gold, limestone, mica, graphite, opals, and carbonate of soda have been found; pearl-fishing off the coast.

**Shipping and Railways.**—Chief port, Mombasa, *q.v.* Length of Mombasa-Victoria (Uganda) railway, 584 m.

**Exports** (1904–5), £234,670. **Imports,** £518,140.

**British Guiana.**—Area, 120,000 sq. m. Pop. 296,000. A British colony on the N. coast of S. America.

**Physical Features.**—The surface of the coast is rich alluvial plain, parts of which are below sea-level, and intersected by canals; thence it rises in undulating terraces to over 9000 ft. in the interior; the hill portion is covered by dense primeval forests. The principal rivers are the Essequibo and its tributaries, the Berbice, Demerara, and Corentyne.

**Climate.**—The average minimum temperature is 76° F., and the average maximum, 86°. The heaviest rains are in the forest region; on the coast the rainfall is from 120 to 140 inches.

**Resources and Production.**—The cultivation of the sugar-cane is extensively carried on; of a total area of 85,000 acres under cultivation, 70,880 are under sugar. Sugar, rum, and molasses form about nine-tenths of the exports. The forests yield valuable timber in the shape of furniture woods, hard-woods, &c. Gold-mining is actively pursued, the output in 1904–5 being 95,864 ozs., valued at £339,518. Diamonds are also mined, the production in 1903–4 being 10,478 carats.

**Shipping and Railways.**—The two principal ports are Berbice and Georgetown (Demerara). Tonnage entered and cleared (1904–5), 866,604. In 1905 the merchant fleet comprised 17 steamers of 1418 tons, and 38 sailing vessels of 1638 tons.

**Exports** (1904–5), £1,991,000; including sugar, £1,280,600; raw gold, £327,527; rough diamonds, £18,756. **Imports** (1904–5), £1,537,600.

**British Honduras.** Area, 7560 sq. m. Pop. 37,500. A Crown colony in Central America on the Caribbean Sea.

**Physical Features.**—Flat and swampy for about ten miles inland from the coast, the level rises into forest-clad hills from 500 to 4000 ft. high; the N. part is a flat swamp; the S. part is diversified by hills and plateaus.

**Climate.**—Hot, but not unhealthy; temperature ranges from 56° to 96°, with a mean of about 78°, tempered by sea breezes. Sheltered from hurricanes, and rarely visited by earthquakes.

**Resources and Production.**—Forest products and tropical fruits are the main sources of wealth. In 1904 there was exported 9,811,680 superficial feet of mahogany; 11,381 tons of logwood; 508,200 bunches of bananas; 3,391,250 cocoanuts; and 758,650 ft. of cedar-wood. Other products are rubber, sarsaparilla, tortoise-shell, &c.

**Shipping.**—The chief town and port is Belize. Tonnage of vessels entered and cleared in 1904, 503,557 tons, of which 239,270 was British.

**Exports** (1904–5), £383,500; to the U.K., £86,100. **Imports**, £361,600; from U.K., £96,200.

**British South Africa Company.** *See* **Rhodesia.**

**Bruges**, a port of Belgium, 8 miles inland from North Sea, connected by three canals with Ostend, Sluis, and Zeebrugge. Lat. 51° 13′ N.; long. 3° 13′ E. Pop. (1901), 51,657.

**Port Accommodation.**—The new canal from Zeebrugge is 230 ft. wide and 26½ ft. deep. Quayage at dock, 1213 ft.; depth of water in dock, 14 ft.

**Trade.**—Exports: lace, cattle, chicory, oak bark, rags, bones, fruits, &c.; imports: wool, cotton, dyewood, wine, grain, salt, coal, metals, &c.

**Brunei**, port in British N. Borneo. Lat. 4° 53′ N.; long. 114° 55′ E. Pop. 10,000.

**Port Accommodation.**—Vessels of 20 ft. draught can ascend to the town at high water.

**Trade.**—Exports: sago, birds' nests, indiarubber, gutta-percha, &c.; imports (mainly from Singapore): cotton cloths, iron, gunpowder, tobacco, rice, &c.

**Brunsbüttel**, port at mouth of the Elbe and terminus of the Kaiser Wilhelm Canal, Schleswig-Holstein. Lat. 53° 55′ N.; long. 9° 5′ E. Pop. 2151.

**Port Accommodation.**—Depths at high and low water ordinary springs, 32½ and 24½ ft.

**Buenaventura**, a port of Colombia, on Pacific coast. Lat. 3° 49′ N.; long. 77° 11′ W.; 11,076 miles from London *viâ* Magellan, and 358 m. from Panama. Pop. 5000.

**Port Accommodation.**—Vessels of 24 ft. draught can ascend the R. Dagua (10 miles) to the town.

**Steam Communication.**—Pacific S.N. Co. and Compañia Sud-Americana from Panama.

**Trade.**—Exports are cocoa, rum, sugar, hides, and tobacco; imports are salt, garlic, straw-hats, and hammocks. British Consular Agent.

**Buenos Ayres**, capital of the Argentine Republic, port and coaling station on the Rio de la Plata. Lat. 34° 36′ S.; long. 58° 22′ W.; 6294 miles from London; 6675 m. from Liverpool; and 8885 m. from Adelaide. Pop. (1903), 891,000.




**Port Accommodation.**—Depth of N. entrance channel, 20 to 23 ft.; S. channel, 17 to 22 ft. Quayage and wharfage of the Boca del Riachuelo and docks, 50,000 ft., with depths from 16 to 27 ft. at high water. Three dry docks and two slips. Good railway connections.

**Steam Communication.**—Royal Mail S.P. Co., and North German Lloyd, from Southampton; Pacific S.N. Co. and other lines from Liverpool; Austrian Lloyd from Trieste.

**Trade.**—Exports: live stock, hides, horns, bones, tallow, wool, wheat, maize, &c. (1905), £64,569,000; imports: coal, iron, dry goods, hardware, provisions, wines, &c., £41,031,000. B. C.

**Bulgaria.**—Area, with Eastern Rumelia, 37,200 sq. m. Pop. (1903), 4,308,000.

**Physical Features.**—Traversed from W. to E. by the Balkans, the N. part of the land descends by terraces to the Danube, while the S. consists of the broad plain of E. Rumelia, watered by the Maritsa, and extending to the Despoto Dagh; the N. rivers belong to the Danube basin; those of the E. flow to the Black Sea; and the Struma and Maritsa in the S. to the Ægean Sea.

**Climate.**—Great variations of temperature (from 23.8° F. in winter, to 104° in summer); mean, 51.8°; rains occur in spring and autumn.

**Resources and Production.**—Agriculture, cattle-rearing, forestry, and mining are the chief occupations. Area under forests, 7,511.581 acres; cultivated area, 6,225,390 acres; under cereals, 4,653,410; under vines, 276,640 acres; under tobacco, 12,844 acres; silk is largely cultivated; attar of roses is also manufactured and exported. The coal mines of Pernik yield about 125,000 tons a year; iron is found in large quantities; gold, silver, manganese, copper, and lead exist in the country; valuable salt deposits at Burgas.

**Shipping and Railways.**—Chief ports, Burgas and Varna, *q.v.* Vessels entered (1904), 14,172, of 3,371,605 tons; cleared, 14,162, of 3,358,686 tons. Railways open (1904), 972 m.

**Exports** (1904), £6,304,760; to the U.K., £989,120. **Imports** (1904), £5,187,600; from the U.K., £753,960.

**Bunder Abbas**, a port of Persia, on the Persian Gulf. Lat. 27° 11′ N.; long. 56° 17′ E.; 12 miles NW. of Ormuz; 724 m. from Karachi; and 6072 from London. Pop. 7000.

**Port Accommodation.**—Good anchorage for large vessels in 4 to 5 fathoms about 2 miles off town.

**Trade.**—Exports are cotton, carpets, drugs, dyes, dried fruits, opium, woollen and silk goods, &c. (1905), £155,762; imports are dry goods, hardware, sugar, spices, glassware, &c., £399,699. B. V.-C.

**Burgas**, a port of E. Rumelia. Lat. 42° 30′ N.; long. 27° 30′ E. Safe roadstead.

**Steam Communication.**—Fraissinet & Cie. to Marseilles; Austrian Lloyd from Trieste; German Levant line from Hamburg.

**Trade.**—Exports, £44,000; imports, £12,600. Consular Agent.

**Bushire**, a port and coaling station on east shore of Persian Gulf. Lat. 28° 59′ N.; long. 50° 50′ E.; 6409 miles from London. Pop. 25,000.

**Port Accommodation.**—Vessels drawing from 20 to 20½ ft. can often cross the bar. Depth over shoal water at entrance at high and low spring tides, 19½ and 13 ft.; in port at high and low water, ordinary springs, 25 and 19 ft. Loading and discharging by native boats.

**Trade.**—Exports are opium, gum, carpets, tobacco, cotton, hides and skins, horses, mother-of-pearl, rose-water, &c. (1904), £455,000; imports are cotton goods, silks, sugar, tea, indigo, copper, kerosine, specie, &c., £890,000. B. C.

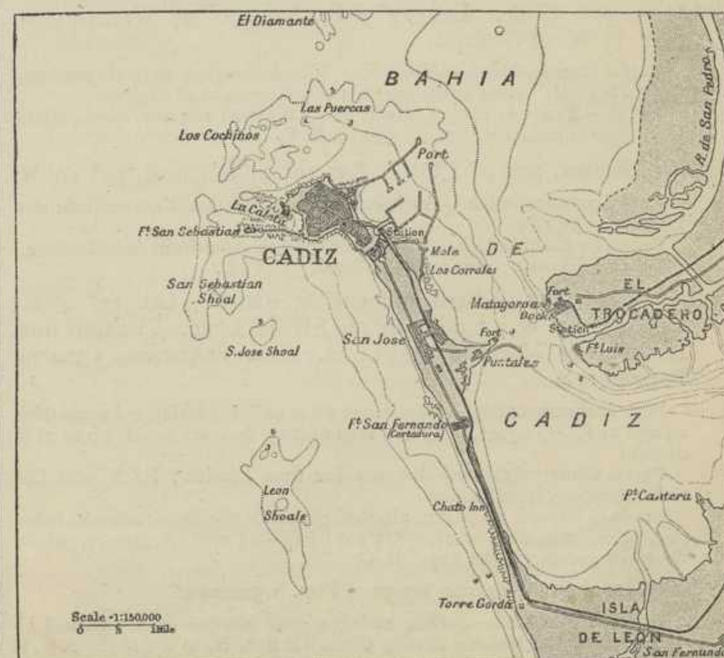
**Bussorah (Basra)**, port and coaling station, Asiatic Turkey, on the Shat-el-Arab, 70 miles from its mouth in the Persian Gulf. Lat. 30° 29′ N.; long. 47° 34′ E. Distance from London, 6585 m. Pop. 18,000.

**Port Accommodation.**—Depth for vessels anchoring in Bussorah Reach, 30 ft.; rise and fall of tides, about 10 ft. Vessels of 18 to 18½ ft. fresh-water draught can cross the bar.

**Trade.**—Largely a transit one with Bagdad, 200 m. higher up the Euphrates. Exports chiefly barley and dates (1904), £1,305,780; imports include silk, woollen, and cotton goods, £1,260,709. B. C.

**Cadiz**, fortified seaport, naval and coaling station, Spain, on the Atlantic. Lat. 36° 28′ N.; long. 6° 12′ W. Distance from London, 1254 miles; from Leith, 1557 m.; Glasgow, 1322 m. Pop. 69,382.

**Port Accommodation.**—Quayage, 2½ m., suitable for small vessels only. High and low water depths at entrance to harbour, 14 and 5 ft.; Puntales



iron pier, 25 and 19½ ft.; wharves, 22½ and 18 ft.; Trocadero pier, 17 and 12 ft. Good anchorage for large vessels in bay.
**Steam Communication.**—Hall line and Spanish line from London; Cia. Transatlantica from Liverpool.
**Trade.**—Exports: sherry, salt, olives, fruits, corkwood, canary-seed, &c.; imports are coal, cask-staves, sugar, iron, timber, hides, tobacco, alcohol, &c. B. C.

**Cagliari,** port and coaling station, Sardinia. Lat. 39° 1′ N.; long. 9° 7′ E.; 353 miles from Marseilles; 168 m. from Tunis; and 2033 m. from London. Pop. (1901), 53,057.

**Port Accommodation.**—Depth at entrance to harbour, 24 ft.; alongside quays, 6 to 26 ft.; anchorage above 26 ft. in roadstead. Slipway.
**Steam Communication.**—Florio Rubattino from Genoa, Naples, or Venice.
**Trade.**—Exports are lead ore, corn, wine, skins, &c. (1904), £1,541,000; imports are cereals, coffee, coal, wood, petroleum, cotton goods, metals, and machinery, £985,600. B. C.

**Cairns,** a port of N. Queensland, on Trinity Inlet. Lat. 16° 55′ S.; long. 145° 47′ E.; 990 miles NW. of Brisbane. Pop. (1901), 3557.

**Port Accommodation.**—Fine harbour for coasters. Depth at entrance at high and low water, 23½ and 15 ft. Wharfage, 750 ft., with depths alongside from 14 to 22 ft.
**Trade.**—Exports: gold, silver, and tin.

**Calais,** port and coaling station, NW. France, on Straits of Dover. Lat. 50° 57′ N.; long. 1° 51′ E.; 26 miles ESE. of Dover. Pop. (1901), 59,743.

**Port Accommodation.**—Depth in roads at low water, 33 ft. Carnot dock has 28 ft. 8 in. and 24 ft. 5 in. at high water, springs and neaps; quayage, 6384 ft. Depths in other docks, from 15 ft. at low water to 46 ft. at highest springs. Dry dock, 500 ft. long.
**Trade.**—Exports are cotton, linen, silk, tulle, oil, grain, spirits, wine, sugar, eggs, hemp, &c.; imports are coal, iron, machinery, hardware, jute, petroleum, beer, &c. Value of trade (1904), £10,160,000. B. C.

**Calcutta,** capital of British India, port and coaling station on R. Hugli; 80 miles from the sea. Lat. 22° 34′ N.; long. 88° 24′ E. Distance from London, 7902 m.; Colombo, 1231 m.; Cape Town, 5491 m. Pop., with suburbs (1901), 1,121,664.

**Port Accommodation.**—Length of docks, 10 m. Depth of mean high and low water in Kidderpur docks, over entrance sills, 34 and 23 ft.; in wet dock, 26 ft.; quayage, 9850 ft.; 16 dry docks, and 5 patent slips. Ample railway facilities.
**Steam Communication.**—B.I.S N. and P. and O. from London; Anchor and City lines from Liverpool; M.M. from Marseilles; Natal line from Cape Town, &c.
**Trade.**—Exports: jute, cotton, indigo, wheat, rice, opium, seeds, spices, sugar, hemp, hides, cutch, indiarubber, &c. (1905), £41,000,000; imports are coal, iron, metals, mineral oils, cotton piece goods, textiles, hardware, spirits, provisions, tobacco, &c., £32,530,000.




**Caldera,** port, Chile. Lat. 27° 4′ S.; long. 70° 54′ W.; 40 miles NW. by W. of Copiapó.

**Port Accommodation.**—No docks. Vessels drawing 16 ft. aft can come alongside mole. Good anchorage in 4 to 5 fathoms close to shore.
**Trade.**—Exports: copper, silver, &c., £163,000; imports: coal, bricks, iron, sugar, machinery, &c., £76,900. B. V.-C.

**Caleta Buena,** port of Chile. Lat. 19° 54′ S.; long. 70° 10′ W.

**Port Accommodation.**—Anchorage in 8 to 10 fathoms not far from pier. Landing by lighters.
**Steam Communication.**—P.S.N. and Cia. Sud-Americana from Panama.
**Trade.**—Exports: nitrate, £1,928,000. B. V.-C.

**Callao,** chief port of Peru and coaling station. Lat. 12° 4′ S.; long. 77° 13′ W.; 7 miles by rail SW. of Lima. Distant from London *viâ* Magellan, 10,011 m.; from Valparaiso, 1302 m. Pop. 48,118.

**Port Accommodation.**—Depth over sill at ordinary spring and neap tides, 24 and 21 ft. Quayage, 6815 ft. Iron floating dock for vessels up to 21 ft. draught.
**Steam Communication.**—Kosmos line from London; P.S.N. and Cia. Sud-Americana from Panama.
**Trade.**—Exports are guano, nitrates, chemicals, cochineal, tobacco, hides, rice, sugar, salt, &c. (1904), £873,502; imports: coal, machinery, wheat, flour, dry goods, £2,688,524. B. C.

**Cambodia.**—Area, 37,400 sq. m. Pop. 1,500,000.

**Physical Features.**—Surface mainly a great alluvial plain, fertilised by the waters of the Mekong flowing through it from N. to S.; in the NW. is the Tonle Sap or Great Lake.
**Climate.**—Rainy season from June to November; dry season from December to May.
**Resources and Production.**—Rice is extensively grown and exported; betel, tobacco, indigo, pepper, maize, cinnamon, coffee, the sugar-palm, and the silk tree are also cultivated; the planting of cotton is extending.
For trade *see* **Cochin-China.**

**Cameroons.** *See* **Kamerun.**

**Campeche,** port, Mexico. Lat. 19° 50′ N.; long. 90° 33′ W.; 90 m. by rail SW. of Merida. Pop. 18,730.

**Port Accommodation.**—Anchorage within a mile off coast for vessels drawing 10 ft.
**Steam Communication.**—Ward line from New York.
**Trade.**—Exports: dyewoods, cordage, wax, sugar, &c.; imports: manufactured goods and silks. B. V.-C.

**Canada.** Area, 3,620,000 sq. m. Pop. (1901), 3,572,000.

**Physical Features.**—The surface westward from the hills of the St. Lawrence basin, and the Great Lakes to the Rocky Mountains, is principally plains and undulating lowlands, with tundras stretching northward to the Arctic Ocean. British Columbia is made up of mountains, valleys, and tablelands. Both the eastern and western portions of the Dominion are heavily wooded, chiefly with spruce and pine in many varieties. The great central plains are well adapted for agriculture.
**Climate.**—The summer is warm, and there is extreme cold in winter, but the climate is everywhere healthy. The mean annual temperature and the rainfall in different parts are as follows: St. John (N.B.), 40.4° F., 40.7 in.; Quebec, 38.7°, 25.1 in.; Toronto, 43.8°, 23.2 in.; Winnipeg, 32.7°, 15.2 in.; New Westminster, 48.1°, 59.2 in.; York Factory, 19.7°, 21.1 in.
**Resources and Production.**—In 1901 there were 63,422,338 acres of occupied land, of which 30,166,033 acres were improved land, 19,763,747 acres being under crop. In Ontario, Manitoba, New Brunswick, and the N.W. Territories in 1904 there were 4,231,679 acres under wheat, which yielded 69,028,766 bushels; and 4,239,218 acres under oats, with a yield of 159,959,175 bushels. Ontario produced 3,035,070 lb. of tobacco, and 49,687,423 bushels of apples. The output of cheese in Ontario in 1903 was 82,653 tons, and of butter 5406 tons; the exports of bacon and hams from Canada were 63,858 tons. The area under forests is estimated at 1,248,798 sq. miles. Total value of exports of forest products (1904), £6,780,000. The value of the produce of the fisheries in 1902 was £1,582,000. Total value of mineral products (1904), £12,401,000, including gold, £3,370,000; coal, £3,000,000; copper, £1,132,000; and nickel, £867,000.
**Shipping and Railways.**—Principal ports, St. John, Halifax, Quebec, Montreal, Victoria, and others. The merchant fleet in 1904, inclusive of vessels for inland navigation, comprised 7152 vessels, of 672,838 tons; of these 2543, of 238,550 tons, were steamers. Vessels entered (1904) at ports, 8212, of 5,351,533 tons (British and Canadian); 6773, of 2,792,323 tons (foreign); vessels cleared, 7830, of 4,674,087 tons (British and Canadian); and 7229, of 3,008,762 tons (foreign).
**Exports** (1905), £41,777,000. **Imports,** £54,829,000. The U.K. takes about half the exports and contributes a tenth of the imports.

**Canary Islands.** A group of islands belonging to Spain, and lying off the N.W. coast of Africa. The principal islands are Lancerote, Fuerteventura, Gran Canaria, Tenerife, and Palma.

**Trade.**—Exports: bananas, tomatoes, wines, and potatoes, £956,000 (1904); imports: provisions and general merchandise, £3,628,000.

**Canea,** port on N. coast of Crete. Lat. 35° 29′ N.; long. 24° 1′ E.; 148 miles from the Piræus; 339 m. from Corfu. Pop. (1900), 21,025.

**Port Accommodation.**—Harbour with depth of 32 ft. at entrance, but only 14 to 15 ft. at anchorage. Large steamers anchor in roadstead.
**Steam Communication.**—Austrian Lloyd from Trieste, Corfu, &c.
**Trade.**—Exports are olive-oil, carobs, raisins, oranges, valonia, wine, soap, cheese, &c.; imports are calico, silks, cutlery, jewellery, coal, barley, rice, tobacco, timber, rum, spirits, jute, fish, &c. B. C.

**Canton,** a port of Kwang-tung, China, on Canton R., 70 miles from its mouth. Lat. 23° 7′ N.; long. 113° 14′ E.; 90 m. NW. of Hong-Kong. Distance from Singapore, 1496 m. Pop. 1,500,000.

**Port Accommodation.**—Depth at entrance, 13 to 14 ft. at high water ordinary springs; 11 ft., ordinary neaps; in port, high and low water ordinary springs, 24 ft. and 18 ft. Large vessels lighten at Whampoa. Vessels of 12 ft. draught can reach the wharves.
**Trade.**—Exports include tea, silk, matting, tobacco, sugar, buttons, cassia, camphor, eggs, &c. (1905), £6,194,000; imports are cotton goods, woollens, kerosene, opium, coal, metals, ground-nuts, wheat flour, dyes, matches, &c., £7,555,000. B. C.

**Cape Coast Castle,** port and naval coaling station on Gold Coast. Lat. 5° 6′ N.; long. 1° 14′ W. Distance from London, 3807 miles. Pop. (1900), 11,614.

**Port Accommodation.**—Open roadstead. Loading and discharging by surf boats.
**Steam Communication.**—Elder-Dempster line from Liverpool; Woermann from Hamburg.
**Trade.**—Exports: palm-oil, gold-dust, pepper, rubber, skins, &c.; imports: arms and ammunition, manufactured goods, hardware, glassware, spirits, &c.

**Cape Colony.**—Area, 277,000 sq. m. Pop. (1904), 2,405,600.

**Physical Features.**—Coast belt generally low and flat, with Table Mountain in the SW.; surface then rises in a series of terraces to the Orange river; the mountain ranges generally lie parallel to the coast; much of the surface consists of level plains or karroos; rivers are numerous but shallow, unless swollen by rains.
**Climate.**—Salubrious and dry, but with a wide diurnal range of temperature; mean annual temperature at Cape Town, 62.3° F. with 25.46 in. rainfall; Kimberley, 66.4° F. with 17.9 in. rain; Graaff-Reinet, 64° F. with 15.03 in.; Aliwal North, 59.8° F. with 25.19 in.
**Resources and Production.**—Agriculture, vine-growing, sheep and ostrich farming, cattle-rearing, mining, and fruit-growing are actively pursued. 47,000,806 acres are still undisposed of. The Kimberley mines produced in 1904 diamonds to the value of 60 million sterling, and copper ore to the value of £514,286 was exported.
**Shipping and Railways.**—Chief ports are Cape Town, E. London, Port Elizabeth, *q.v.* Merchant fleet (1904), 49 steamers, of 10,578 tons, and 5 sailing ships, of 331 tons. Vessels entered inwards (1904), 1365, of 5,732,791 tons; cleared outwards, 1398, of 5,312,325 tons. Railways, 3080 m.
**Exports** (1905), £33,307,000; to the U.K., £31,701,000. **Imports** (1905), £19,761,000; from the U.K., £11,309,000.

**Cape Hayti,** port on N. coast of Hayti. Lat. 19° 47′ N.; long. 72° 11′ W. Distance from New York, 1288 miles; Halifax, 1559 m.; Havre, 3818 m. Pop. 20,000.

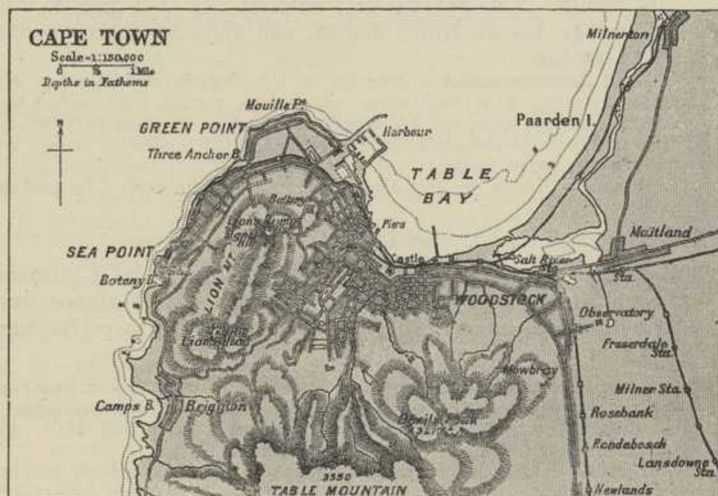
**Port Accommodation.**—Quay for vessels of 15 ft. draught; larger vessels anchor three cable-lengths off the town.
**Trade.**—Exports are coffee, cocoa, logwood, honey, &c.; imports are lumber, hardware, tobacco, provisions, fish, &c.

**Cape Palmas,** a port of Liberia. Lat. 4° 22′ N.; long. 7° 44′ W.; 3416 miles from London.

**Port Accommodation.**—Depth on bar at high water, 7 to 9 ft.; in port, 27 ft. Vessels anchor in roadstead and discharge by surf boats.
**Steam Communication.**—B. & A.S.N. from Liverpool, and Woermann line from Hamburg.
**Trade.**—Exports are gold, ivory, palm-oil, kernels, ostrich feathers; imports are glass beads, hardware, manufactured goods, spirits, &c.

**Cape Town,** seaport, coaling station, and capital of Cape Colony, on Table Bay. Lat. 33° 56′ S.; long. 18° 29′ E. Distance from Southampton, 5947 miles; 673 m. from Durban; and 5603 m. to Adelaide. Pop. (1904), 87,483.

**Port Accommodation.**—Good anchorage in Table Bay in 5 to 8 fathoms. Harbour sheltered by breakwater 3640 ft. long. Water area of Alfred Basin, 8½ acres; quayage, 2400 ft.; depth at low water ordinary springs, 24 ft. Victoria Basin, 68½ acres; quayage, 1100 ft.; depths, 19 to 30 ft.; jetties and quays, 5568 ft. Dry dock and patent slip. New harbour with minimum depth of 27 ft. under construction.
**Steam Communication.**—U.C. line from Southampton; White Star from Liverpool; N.Z.S., Shaw from London, &c.
**Trade.**—Exports: wool, diamonds, ostrich feathers, gold, wine, ivory, hides, horns, &c. (1904), £17,385,000; imports: general merchandise, machinery, hardware, woollens, cotton goods, tea, sugar, &c., £8,081,000.




**Cape Verde Islands.** Open bays at Porto Grande and Porto Praia, with coaling stations.

**Cardiff,** seaport and coaling station, Glamorgan, S. Wales. Lat. 51° 28′ N.; long. 3° 10′ W.; 25 miles by water W. of Bristol. Pop. (1901), 164,333.

**Port Accommodation.**—Water area of docks, 161 acres, besides 24 acres of timber floats. Total quayage, 38,860 ft. Depth in entrance channel at high water of ordinary springs and neaps, 39 ft. and 29 ft.; in Steam Packet harbour, 33½ ft. and 23½ ft. Depths in locks range from 15 ft. at lowest neaps to 42½ ft. at highest springs. Glamorganshire Canal Basin has 18 ft. at ordinary spring, and 8 ft. at ordinary neap tides. Thirteen dry docks, 2 pontoons, a gridiron, and 2 patent slipways. The new South Dock has recently been opened.
**Trade.**—Exports: chiefly steam coal, tinplates, and iron (1905), £9,695,000; imports are provisions, grain, timber, iron ore, esparto, and general produce, £5,173,000.




**Cartagena,** port in N. of Colombia. Lat. 10° 19′ N.; long. 75° 35′ W.; 266 miles from Colon; and 481 m. from Greytown. Pop. 20,000.

**Port Accommodation.**—Land-locked harbour, with sufficient water for largest vessels afloat. Patent slipway with cradle, 130 ft. long.
**Steam Communication.**—R.M.S.P. from Southampton, Atlas from New York, &c.
**Trade.**—Exports are dyewoods, cedar, mahogany, hides, indiarubber, coffee, cocoa, cocoanuts, tobacco, gold, platinum, &c., £600,000; imports: machinery, provisions, and general merchandise, £250,000. B. V.-C.

**Cartagena,** port and naval arsenal in SE. of Spain. Lat. 37° 36′ N.; long. 0° 59′ W.; 1544 miles from London; 114 m. from Oran. Pop. (1900), 99,871.

**Port Accommodation.**—Good harbour. Quayage, 3598 ft.; depth alongside, 27 ft.; at harbour entrance, 32½ ft. Floating dock, with lifting power of 6000 tons; a patent slip; and a dry dock, 492 ft. long.
**Steam Communication.**—Spanish line from London.
**Trade.**—Exports: silver, lead, zinc, and iron ores, esparto, fruits, &c. (1904), £1,295,000; imports are coal, coke, chemicals, wood, grain, flour, naval stores, &c., £328,800. B. V.-C.

**Casablanca** (Dar-el-Baida), a port in W. of Morocco. Lat. 33° 37′ N.; long. 7° 20′ W. Pop. 10,000. Distance from Tangier, 160 miles.

**Port Accommodation.**—Open roadstead, with anchorage for steamers in 5 to 6 fathoms, and for sailing ships in 10 fathoms water. Loading and discharging by lighters.
**Steam Communication.**—Forwood line from London; C.T. from Cadiz; Woermann from Hamburg.
**Trade.**—Exports: wool, maize, chick peas, goat-skins, linseed, coriander, beans, &c., £282,000; imports: cottons, woollens, iron, hardware, sugar, tea, &c., £344,000. B. V.-C.

**Castellammare,** sea-port of Italy, on the Bay of Naples.

**Trade.**—Exports: macaroni, olive oil, fruits, and cheese, (1904), £769,100; imports: £1,239,048. B. V.-C.

**Castries,** a port and British naval station on W. coast of St. Lucia, W. Indies. Lat. 14° 1′ N.; long. 61° 0′ W.; 3878 miles from London; 2656 m. from Teneriffe. Pop. (1901), 7757.

**Port Accommodation.**—Quayage, 940 ft.; depth (Central wharf) at low water, 16 ft.; (Northern wharf), 27 ft.
**Steam Communication.**—R.M.S.P. from Southampton.
**Trade.**—Exports are sugar, cacao, logwood (1904), £101,450; imports: coal, and general merchandise, £370,700.

**Catania,** port in Sicily, on the E. coast. Lat. 37° 28′ N.; long. 15° 5′ E.; 59 miles by rail SW. of Messina. Distance from London, 2389 m.; Naples, 230 m. Pop. (1901), 149,295.

**Port Accommodation.**—Depth at entrance to harbour, 39 to 59 ft.; at anchorage, 13 to 26 ft. Quayage, 4619 ft.; depth alongside (new port), 23 to 29½ ft.; (old port), 19¾ to 26¼ ft.
**Steam Communication.**—Rub. from Genoa and Naples.
**Trade.**—Exports: sulphur, oranges, lemons, green and dried fruits, liquorice, wine, oil, cereals, &c.; imports are coal, iron, machinery, manufactures of different kinds. B. V.-C.

**Cayenne,** seaport, French Guiana. Lat. 4° 57′ N.; long. 52° 21′ W.; 3959 miles from London. Pop. 10,000.

**Port Accommodation.**—Wide bay, with anchorage for large vessels 6 miles off shore. Vessels under 14 ft. draught can lie close to town.
**Trade.**—Exports are coffee, cocoa, pepper, maize, rice, tobacco, indigo, vanilla, &c.; imports: general manufactures, cotton, flour, sugar, &c. B. C.

**Ceará,** port and coaling station, Brazil. Lat. 3° 42′ S.; long. 38° 28′ W.; 3901 miles from London; and 3021 m. from Lisbon. Pop. 40,000.

**Port Accommodation.**—Vessels drawing 15½ ft. can enter the roadsteads, but the harbour is gradually filling up with sand. Outside the reef there is 30 to 36 ft. depth at high water.
**Trade.**—Exports: cotton, indiarubber, skins, hides, coffee, sugar, &c., £800,000 (1904); imports are manufactured goods, general merchandise, hardware, machinery, wine, beer, &c., £347,000. B. V.-C.

**Celebes.** *See* **Macassar.**

**Cephalonia.** *See* **Argostoli.**

**Cette,** a port in S. of France, on the Mediterranean. Lat. 43° 24′ N.; long. 3° 42′ E.; 17 miles SSW. of Montpellier. Distance from London by sea, 1956 m. Pop. (1901), 33,246.

**Port Accommodation.**—Water area of docks about 83 acres; available quayage, 16,700 ft.; depths alongside, 11½ to 24 ft.
**Trade.**—Exports are wine, brandy, fruits, salt, manures, coal; imports include pitch, coal tar, coal, tallow, petroleum, oranges, citrons, Italian, Spanish, and other foreign wines for blending, &c. B. V.-C.

**Ceylon.**—Area, 25,330 sq. m. Pop. (1901), 3,578,400.

**Physical Features.**—Surface generally flat or undulating plain; mountainous in the S. central part; highest peak, Pedrotallagalla, 8296 ft.; chief river, the Mahaviligunga, flowing NE. to the sea, near Trincomalie.
**Climate.**—Healthy, except on coast. Mean temperature at Colombo, 81° F.; the monsoons bring a copious rainfall.
**Resources and Production.**—Cultivated area, 2,231,948 acres; pasture land, 826,427 acres. The area (in acres) under rice and other grains (1898) was 753,872; under coffee, 19,023; tea, 424,856; cinchona, 749; coco-nuts, 864,296; cinnamon, 46,117; tobacco, 11,127; cocoa, 33,260. Number of horses (1902), 4127; horned cattle, 1,398,209; sheep, 83,620; goats, 163,987. There are 1692 plumbago mines, and 412 gem quarries. Valuable pearl fishery.
**Shipping and Railways.**—Principal ports, Colombo, Galle, Batticaloa, and Trincomalee. Merchant fleet (1905), 9 steamers of 1203 tons, and 159 sailing vessels, of 12,991 tons. Tonnage entered and cleared (1904), 11,226,599. Length of railways, 436¼ m.
**Exports** (1905), £6,832,670; to U.K., 52.8 per cent. **Imports,** £7,221,622; from U.K., 33.3 per cent.

**Champerico,** a port of Guatemala. Lat. 14° 17′ N.; long. 91° 47′ W., 41 miles by rail from San Felipe. Pop. 1500.

**Port Accommodation.**—Open roadstead, with anchorage in 6 fathoms of water.
**Steam Communication.**—Pacific Mail from San Francisco.
**Trade.**—Exports are coffee, indiarubber, tobacco, cochineal, &c.

**Charleston,** port and coaling station, S. Carolina, at junction of Ashley and Cooper rivers, 7 miles from the sea. Lat. 32° 41′ N.; long. 79° 52′ W.; 3770 m. from London; 614 m. from New York; and 1107 m. from New Orleans. Pop. 56,062.

**Port Accommodation.**—Fine harbour, with depth of 50 ft. at high water; depth throughout entrance channel, 23 ft. at low water. Wharfage, with depth from 10 to 20 ft. alongside at high water. Three slipways. Good railway facilities.
**Trade.**—Exports are cotton, rice, hams, bacon, phosphates, and general merchandise; imports are iron and steel, textile goods, fruits, crockery, &c. B. C.

**Charlestown,** port of Nevis, Leeward Is., W. Indies. Lat. 17° 6′ N.; long. 62° 32′ W.; 1741 miles from Halifax (N.S.).

**Port Accommodation.**—Open roadstead, with anchorage in 5 fathoms. Loading and discharging by lighters.
**Steam Communication.**—Royal Mail S.P. from Southampton.
**Trade.**—Exports: sugar, molasses, rum, tamarinds, limes, oranges, cotton; imports: mainly provisions.

**Charlottetown,** seaport, Prince Edward Island, on the Hillsborough estuary. Lat. 45° 14′ N.; long. 63° 70′ W. Distance from Sydney (C.B.), 211 miles. Pop. (1901), 12,080.

**Port Accommodation.**—Spacious harbour; depth at entrance at high water (springs), 42 ft.; (neaps), 39 ft.: in port (average), 48 ft.; wharfage, 300 ft.; depth alongside at high water, 20 ft. Railway wharf, 710 ft. long, with depth of 25 ft. at low water.
**Trade.**—Exports: fish, oysters, canned meats, pork, horses, sheep, cheese, &c. (1904), £143,000; imports: coal, bricks, and general merchandise, £115,000.

**Chemulpo,** port of Korea, on W. coast. Lat. 37° 27′ N.; long. 126° 39′ E. Distance from Chifu, 270 miles; Port Arthur, 394 m.; Nagasaki, 446 m. Pop. (1900), 27,000.

**Port Accommodation.**—Outer anchorage suitable for largest vessels; inner anchorage for coasters. River navigable as far as Mapu for vessels drawing 10 ft. and under.
**Trade.**—Exports are vegetables, rice, and hides; imports: cotton goods, metals, &c. B. V.-C.

**Cherbourg,** commercial and naval port and coaling station in France, on the English Channel. Lat. 49° 39′ N.; long. 1° 33′ W.; 75 miles from Portsmouth, and 83 m. from Southampton. Pop. (1901), 42,938.

**Port Accommodation.**—The roadstead, sheltered by a breakwater, has anchorage of 1250 acres. Area of tidal harbour, 15 acres; quayage, 1968 ft.; depth at high water, 26.2 ft. Area of Bassin du Commerce, 13 acres; quayage, 2887 ft.; depth at high water springs over sill, 25 ft. 3 in. to 27 ft. 1 in.; neap tides, 17 ft. 5 in. to 19 ft. 8 in. Nine dry docks.
**Steam Communication.**—R.M.S.P., and L. & S.W. Rly.'s steamers from Southampton, &c.
**Trade.**—Exports: butter, eggs, vegetables, potatoes, fruit, cattle, horses, pigs, &c.; imports: coal, timber, cement, guano, &c. B. C.

**Chifu,** port of China, at entrance to the Gulf of Pechili. Lat. 37° 36′ N; long. 124° 23′ E. Distance from Shanghai, 510 m.; Tientsin, 245 m.

**Port Accommodation.**—Open bay, with high and low water depths of 50 and 42 ft. respectively. Loading and discharging by lighters.
**Trade.**—Exports: straw braid, beans, fish, silk, &c., £1,797,800; imports: cotton goods, sugar, coal, tobacco, opium, £2,580,700. B. V.-C.

**Chile.**—Area, 292,420 sq. m. Pop. 3,206,000.

**Physical Features.**—The surface slopes in general from E. to W. and from N. to S., and is naturally divided into the saline pampas of the N., the fertile central plain, and the cold insular region of the S., with its many inlets and broken coast-line. The rivers are many, but of no great length, owing to the proximity to the coast of the mountains in which they have their sources.
**Climate.**—This varies greatly with the latitude and altitude; mean temperature at Arica, 68° F.; at Iquique, 66°; Valparaiso, 57.2°; Ancud, 50°; Straits of Magellan, 5°. There is little or no rainfall in the N.; at Valparaiso the rainfall is 13 in.; at Santiago, 16½ in.; at Valdivia, 96 in.; and at Cape Horn, 108 in.
**Resources and Production.**—The arid region of the N. is unsuited for agriculture, but the soil between 32° and 43½° is well adapted for the growth of cereals, vegetables, and fruit; the forest-clad regions of the S. give rise to a considerable trade in lumber. In 1903 the yield of the chief crops was: wheat, 5,353,454 cwts.; barley, 1,486,159 cwts.; potatoes, 5,532,308 cwts. The live stock comprised 182,821 horses; 32,443 mules; 829,953 oxen; 1,335,332 sheep; besides pigs and goats. Minerals form the chief wealth of the country; gold, silver, copper, sulphur, borate of lime, coal, guano, and nitrate are worked, and the total value in 1903 was £13,408,000.
**Shipping and Railways.**—The chief ports are Antofagasta, Arica, Caldera, Coquimbo, Coronel, Valparaiso, and others. The merchant fleet in 1904 consisted of 132 ships, of 72,987 tons; the number of vessels entered at the ports was 11,394, of 16,018,438 tons; and the number of those cleared, 11,359, of 15,920,513 tons.
**Exports** (1905), £18,600,000; to U.K., 38 per cent. **Imports,** £15,400,000; from the U.K., 38 per cent.

**China.**—Area (with Manchuria, Mongolia, Tibet, and Chinese Turkestan), 4,376,000 sq. m.

**Physical Features.** — The chief surface characteristics are mountain ranges, fertile alluvial plains, lofty plateaus, and in Mongolia the waterless Gobi, or Shamo desert. The general slope of the land is from W. to E.; the rivers are numerous, the principal being the Yang-tse-kiang, Hoang-ho, Si-kiang, and the Amur; there are many lakes and canals.
**Climate.**—Varies greatly with latitude. Mean annual temperature of Canton, 69.8° F., Peking, 50° F., Urga (Mongolia), 27.5° F.; in E. Turkestan the mean for July is 78.5°, and for January, 13° F. Rainfall copious in summer in the S. and E. Regularly visited by typhoons and the SW. monsoon.
**Resources and Production.**—Agriculture is the mainstay of the country; in the N. the chief crops grown are wheat, barley, maize, millet, pease and beans; in the S., rice, sugar, indigo, and cotton; in the W. and S., tea, opium, &c. There is also a large silk industry. Of the minerals worked, coal is the most important; others are iron, antimony, alum, borax, petroleum, copper, tin, lead, zinc, sulphur, cinnabar, spelter, platinum, gold, silver, jade, diamonds, and precious stones, &c.
**Shipping and Railways.**—The principal ports of shipment are Canton, Hong-Kong, Shanghai, Tientsin, Fu-chau, Niuchwang, &c. Vessels entered and cleared (1904), 223,835, of 63,774,706 tons, of which 31,298 vessels, of 32,933,873 tons, were British, and 146,865 vessels, of 14,767,971 tons, were Chinese. Railways completed (1904), 3433 miles.
**Exports** (1905), £34,278,000; to U.K., £2,717,000. **Imports,** £69,371,000; from U.K., £12,507,000.

**Chinde,** a port at the Chinde mouth of the Zambesi, Portuguese E. Africa. Lat. 18° 34′ S.; long. 36° 30′ E. There is a British concession where goods for British Central Africa are transhipped. Pop. (1904), 1204.

**Port Accommodation.**—Depth on bar, 12 to 18 ft.
**Trade.**—Exports are coffee, sugar, ivory, wax, oil-seeds, and rubber, (1905), £64,313; imports: cotton goods, foodstuffs, metals, tobacco, and wine, £89,633. The value of goods landed in the British Concession is not included. B. V.-C.

**Chinkiang,** a port of China, at mouth of the Yang-tse-kiang. Lat. 32° 14′ N.; long. 119° 28′ E.; 150 miles NW. of Shanghai. Pop. 140,000.

**Port Accommodation.**—Vessels of largest tonnage can enter at all states of the tide. Discharging done into hulks.
**Trade.**—Exports are beans, bean-cake, peas, ground-nuts, silk, hides, dried flowers, &c. (1905), £1,362,000; imports: coal, cottons, opium, petroleum, bêche-de-mer, dyes, &c., £2,727,000. B. C.

**Chittagong,** a port of Bengal, on Karnaphuli R., 12 miles from its mouth. Lat. 22° 14′ N.; long. 91° 50′ E.; 330 m. from Calcutta; 854 m. from Madras, and 7961 m. from London. Pop. 22,140.

**Port Accommodation.**—Outer bar, with 22 to 25 ft., and inner bar, with 20½ ft. to 23½ ft. at high water. Anchorage, 3 miles long, with 8 to 9 fathoms at high water and 5 to 6 fathoms at low water. Iron jetty, 360 ft.; low water depth alongside, 24 ft. Iron pier, 130 ft.; depth at high and low water, 25 and 13 ft.
**Trade.**—Exports are jute, rice, cotton, and tea; imports: Liverpool salt and kerosene.

**Christchurch** (N.Z.). *See* **Lyttelton.**

**Christiania,** seaport and coaling station, Norway, on Christiania Fjord. Lat. 59° 54′ N.; long. 10° 55′ E. Distance from London, 650 miles; Hull, 552 m.; Leith, 548 m.; Hamburg, 442 m. Pop. (1901), 378,235.

**Port Accommodation.**—Depth of water in harbour, 20 to 80 ft.; quayage, 32,600 ft.; depth alongside, 10 to 27 ft. Dry dock and 2 floating docks.
**Steam Communication.**—Wilson line from London and Hull; also steamers from Leith, Newcastle-on-Tyne, &c.
**Trade.**—Exports include timber, wood-pulp, oil-cakes, ice, ivory, matches, fish, cod-liver oil, preserved milk, iron nails, &c. (1904), £1,817,000; imports are coal, grain, provisions, machinery, iron, steel, beer, and manufactured goods, £6,592,000. B. C.




**Christiansand,** a fortified port of Norway, on a fjord off the Skager Rak. Lat. 58° 5′ N.; long. 8° 3′ E.; 154 m. from Christiania. Distance from London, 537 miles; Leith, 394 m.; Copenhagen, 233 m.

**Port Accommodation.**—Harbour well-sheltered, and suitable for largest vessels. Depth of water in outer harbour, 93 to 124 ft.; inner harbour, 18 to 74 ft. Wooden and stone piers and quays, with depths from 10 to 45 ft. alongside. Dry dock and 3 slips.
**Steam Communication.**—Wilson line from London or Hull; Currie's line from Leith, &c.
**Trade.**—Exports are timber, salt cod, lobsters, salmon, oak bark, paper, cattle, skins, &c. (1904), £220,000; imports: coal, grain, salt, colonial and general goods, £392,600. B. C.

**Christiansund,** port and coaling station on three islands off W. coast of Norway. Lat. 63° 7′ N.; long. 7° 43′ E. Distance from Trondhjem, 89 miles; Hull, 674 m.

**Port Accommodation.**—Secure harbour, with depth at high water from 37 to 140 ft., and at low water from 31 to 134 ft. Total quayage, 1255 ft.; depths alongside, from 10 to 25 ft. at high water, and from 4 to 19 ft. at low water. One patent and 4 common slips.
**Trade.**—Exports: dried and salted fish, cod-oil, herrings, wood and tar, £671,800; imports: salt, iron, coal, flax, hemp, manufactured goods, and produce, £161,800. B. V.-C.

**Cienfuegos,** a port on the S. coast of Cuba. Lat. 22° 10′ N.; long. 80° 27′ W.; 450 miles E. of Havana by water. Pop. (1899), 30,038.

**Port Accommodation.**—Land-locked harbour, 16 m. long by 4½ m. broad, entered by a narrow channel 3½ m. long, with deep water, but shoaling at each side. Depth at anchorage, 12 to 14 fathoms; alongside quays, 12 to 14 ft. Patent slip 212 ft. long, with lifting power of 1200 tons.

**Steam Communication.**—Ward line from New York, and Munson line from Mobile.

**Trade.**—Exports, chiefly sugar. B. V.-C.

**Ciudad Bolivar,** port of Venezuela, on the Orinoco, 271 miles from its mouth. Lat. 8° 8′ N.; long. 63° 55′ W. Pop. (1894), 11,686.

**Port Accommodation.**—Bar at mouth of Orinoco, 16½ ft. Highest water in river during August, September, and part of October; lowest water during February, March, and April. Vessels under 11 ft. draught can always reach the town; larger vessels discharge into barges lower down.

**Trade.**—Exports are gold, cattle, hides, egret plumes, coffee, cigars and tobacco, cocoa, copaiba, &c. (1904), £450,000. Imports are manufactured goods and provisions, £161,000. British Consular Agent.

**Civita Vecchia,** fortified port of Italy. Lat. 42° 5′ N.; long. 11° 44′ E.; 50 miles by rail N. of Rome. Pop. (1901), 15,829.

**Port Accommodation.**—Vessels over 18½ ft. draught are moored to breakwater in outer harbour; depth at entrance to inner port, 22½ ft.; quayage, 5775 ft.; depth alongside, 10 to 17 ft.; quayage at arsenal, 2006 ft.; depth alongside, 13 ft.

**Trade.**—Exports: staves, charcoal, alum, cement, cheese, fine art objects, &c; imports: coal, coke, pig-iron, salt, grain, cattle, hardware, woven goods, &c. B. V.-C.

**Coatzacoalcos,** port in Mexico, on the Gulf, at the eastern terminus of the Tehuantepec railway, 123 miles WSW. of Vera Cruz.

**Port Accommodation.**—Depth in river, 24 to 40 ft. Converging jetties 1400 yds. long have been constructed to confine the current, and cause it to scour out the passage over the bar. Five steel wharves are provided with electric cranes. B. V.-C.

**Cochin,** port on W. coast of Madras. Lat. 9° 58′ N.; long. 76° 14′ E.; 87 miles SW. of Coimbatore. Distance from London, 6475 miles; from Aden, 1865 m. Pop. (1901), 19,274.

**Port Accommodation.**—Depth on bar at high and low water ordinary springs, 13 ft. and 10 ft.; in harbour, 40 ft. and 36 ft. Large vessels anchor in roadstead in 4½ to 6 fathoms, 2 m. off shore.

**Trade.**—Exports are coir yarn, rope, fibre and matting, hides, coconut oil, tea, spices, coffee, wood, &c; imports are rice, textile manufactures, hardware, cutlery, paraffin, grain, sugar, &c.

**Cochin-China.**—Area, 22,000 sq. m. Pop. 2,969,000.

**Physical Features.**—Surface mainly vast alluvial plains, with more elevated tracts in the NE. on the borders of Annam; watered by the Me-kong, Don-nai, Saigon, and E. and W. Vaico; soil extremely fertile.

**Climate.**—Tropical and under the influence of the monsoons. Mean annual temperature at Saigon, 81° F.; rainfall, 82.96 inches.

**Resources and Production.**—Agriculture is the principal occupation, and rice the chief crop; other products are cotton, pepper, copra, silk, cardamoms, hides, fish, and isinglass.

**Shipping and Railways.**—Principal port, Saigon, *q.v.* Vessels cleared (1904), 608, of 871,286 tons.

**Exports** of Indo-China (Annam, Tonking, Cambodia, and Cochin-China), £7,335,269 (1905). **Imports,** £10,279,663.

**Colombia.**—Area, 465,700 sq. m. Pop. 4,501,000.

**Physical Features.**—The country is traversed from S. to N. by a trifurcation of the Andes, known respectively as the Western, Central, and Eastern Cordilleras, with longitudinal valleys between, through which the principal rivers wend their way to the sea. East of the Cordilleras lie the extensive swampy plains or llanos, drained by the head-waters of the Orinoco, and in SE. by rivers of the Amazon basin. The principal rivers are the Magdalena and its tributary; the Cauca, flowing N. to the Caribbean Sea; the Atrato, falling into the Gulf of Darien; the Caqueta, Guaviare, Meta, and Arauca in the E.

**Climate.**—From its tropical situation, and peculiar configuration, Colombia possesses three climatic zones—a hot, a temperate, and a cold one. In the low-lying llanos, the mean annual temperature is from 74° to 86° F.; in the temperate zone (2000 to 8000 ft.), 62° to 72°; and in the cold zone (above 8000 ft.), under 60° F. The heaviest rainfall is on the coast and in the Atrato valley, where it may exceed 200 inches.

**Resources and Production.**—In the low-lying hot zone, sugar-cane, bananas, cocoa, maize, tobacco, indigo, resins, rubber, bread-fruit, various timbers, copaiba, ipecacuanha, vegetables, dyewoods, and vegetable ivory are produced. The temperate zone yields excellent coffee, cinchona, agave, figs, wheat and other grains; the cold zone yields wax from the wax-palm; in the llanos of the E., cattle-rearing is pursued. The mineral wealth of the republic has hardly been exploited as yet, owing to the badness of the roads and the lack of suitable means of transport. Gold and silver are plentiful in the Western and Central Cordilleras, the average annual production being worth about £823,000. Coal, iron, and salt are found on the Bogotá plateau; copper in Boyaca and Magdalena; and other minerals are worked, including emeralds. Cotton is grown in Magdalena and Bolivar, and the cultivation of the rubber tree, which grows wild, has been begun. A considerable trade is done in the export of cattle; the number of cattle in Colombia in 1899 was estimated at 3,465,000; and of goats, sheep, and swine, 3,487,000. Off the coast are valuable pearl fisheries.

**Shipping and Railways.**—In 1904 there entered at Barranquilla 229 steamers, of 782,981 tons. The principal ports of Colombia are Barranquilla (Sabanilla), and Cartagena.

**Exports** and **Imports.**—There are no complete returns. Exports to U.K. in 1904, £670,000; imports from U.K., £945,000.

**Colombo,** port and coaling station, Ceylon. Lat. 6° 56′ N.; long. 79° 55′ E. Distance from London, 6723 miles; Bombay, 883 m.; Calcutta, 1231 m.; Albany, 4370 m. Pop. (1901), 158,228.

**Port Accommodation.**—Water area of harbour, 660 acres. No bar. Depths at high water ordinary spring tides, 25 to 32 ft. Loading and discharging by lighters. Length of quays and jetties, 6150 ft. A coffer-dam, large graving-dock, and patent slipway to take vessels of 1000 tons gross.

**Steam Communication.**—Brit. India, P. & O., Orient lines from London; Bilbury, Cia. Transatlantica, from Liverpool; N. German Lloyd, from Southampton; Messageries from Marseilles.

**Trade.**—Exports are tea, coffee, cinchona, cocoanut oil, pearls, tobacco, cinnamon, bark, plumbago, ivory, satin and other woods; imports include coal, machinery, hardware, manufactured goods, live stock, and rice.

**Colon (Aspinwall),** port in Panama, Atlantic terminus of Panama Canal. Lat. 9° 23′ N.; long. 79° 53′ W. Distance from Liverpool, 4545 miles; New York, 1972 m.; Kingston (Jamaica), 550 m. Pop. 3000.

**Port Accommodation.**—Depth at entrance, 40 ft.; at wharves, 25 to 30 ft.

**Steam Communication.**—Prince line from London, R.M.S.P. from Southampton, &c.

**Trade.**—Exports are mahogany, cedar, fustic, mother-of-pearl, hides, silver and copper ores, indigo, cochineal, coffee, cotton, Panama hats, &c.; imports: coal and general merchandise. B. V.-C.

**Congo Free State.**—Area, 920,000 sq. m. Pop. 19,000,000; Europeans, 2507.

**Physical Features.**—The narrow coast-land is low and swampy; the interior a vast forest-clad plateau, with an average elevation of 3000 ft., intersected by valleys formed by the numerous affluents of the Congo, whose course is much interrupted by cataracts and rapids.

**Climate.**—Unhealthy in the lowlands. Mean annual temperature on coast, 79° F.; in the interior, 82° F.; and in the hilly SE., 73° F.; rainy seasons are March and April, November and December.

**Resources and Production.**—The chief products are rubber, ivory, palm-nuts, palm-oil, and white copal, while the cultivation of coffee, cocoa, and tobacco has been successfully introduced. Iron, lead, copper, mercury, sulphur, and gold have been found.

**Shipping and Railways.**—Principal ports, Banana and Boma, *q.v.* Vessels entered (1904), 671, of 446,130 tons. On the Congo 9 steamers ply between its mouth and Matadi; on the Upper Congo, 32 steamers. Railways from Matadi to Kdolo and Leopoldville, and from Boma to the Lukula, 297 m.

**Exports** (special, 1904), £2,076,000; to U.K., £22,770. **Imports,** £934,000; from U.K., £105,340.

**Constantinople,** seaport and coaling-station, Turkey, on the Bosporus and Sea of Marmora. Lat. 41° 4′ N.; long. 28° 59′ E. Distance from London, 3118 miles; Liverpool, 3081 m.; 357 m. from the Piræus. Pop. 1,125,000.

**Port Accommodation.**—The Golden Horn affords ample and safe anchorage for the largest vessels. Quayage at Galata, 829 yards; depth alongside at low water, 22½ ft. Quayage at Stambul, 399 yards; depth alongside, 22½ ft. Quayage at Haidar Pasha, 318 yards; depth alongside, 26 ft. Two graving docks, a floating dock, and 4 common slipways.

**Steam Communication.**—Moss and Papayanni lines from Liverpool, &c.

**Trade.**—Exports include grain, mohair, opium, silks, carpets, wool, drugs, dyewools, hides (1900–01), £2,669,000; to U.K., £998,000. Imports, coal and merchandise of all kinds, £7,142,000; from U.K., £1,811,000. B. C.



CONSTANTINOPLE
Scale 1:150,000
Depths in fathoms

**Constantza (Kustenji),** port and coaling station of Roumania, on the Black Sea. Lat. 44° 12′ N.; long. 28° 21′ E; 33 miles ESE. of Chernavoda. Pop. (1899), 12,725.

**Port Accommodation.**—Harbour formed by a breakwater. Depth on bar, 26 ft. Quayage open, 4310 ft.; general depth alongside, 26 ft. Petroleum loaded from pipe-lines. Slipway for small tugs and lighters.

**Steam Communication.**—Rub. from Genoa, Naples, &c.

**Trade.**—Exports: wheat, barley, maize, millet, rapeseed, petroleum; imports: coal, iron, timber, agricultural instruments, and general goods. B. V.-C.

**Cooktown,** a port of Queensland, at mouth of the Endeavour R. Lat 15° 27′ S.; long. 145° 17′ E.; 1050 miles NW. of Brisbane. Distance from London *viâ* Suez, 11,215 m. Pop. (1901), 1936.

**Port Accommodation.**—Depth on bar at high water springs and neaps, 23 ft. and 20 ft.; low water, 15 and 16 ft. Four wharves with depths of 5, 9, 13, and 15 ft. Anchorage in basin off wharves.

**Steam Communication.**—B.I.S.N. from London; A. & U.S.N. Co. from Brisbane, &c.

**Trade.**—Exports: bêche-de-mer, pearls, tin, gold, &c.

**Copenhagen,** fortified seaport, naval and coaling station, Denmark. Lat. 55° 50′ N.; long. 12° 34′ E. Distance from Leith, 608 miles; Hull, 602 m.; London, 683 m. Pop. (with suburbs), 476,806.

**Port Accommodation.**—Depth at entrance channel (Kronelöbet) 36 ft.; thence to the freeport, 30½ ft.; thence to Bomlöbet, 26½ ft. Depths in harbours, 5 to 30½ ft. Area of freeport, 61 acres; depths from 24½ to 30½ ft. Harbour quayage, 34,800 ft.; Government and private quayage, 36,000 ft. Three dry and 2 floating docks; 5 patent slips.

**Steam Communication.**—Currie's steamers from Leith; Wilson line from Hull, and others.

**Trade.**—Exports: dairy produce, pork, bacon, horses, cattle, sheep, pigs, wool, fruits, provisions, dyes, yarn, paper, &c.; imports: coal, iron, machinery, tar, timber, cement, manufactured goods, &c. B. C.




**Coquimbo,** port, naval and coaling station, Chile, near mouth of Coquimbo R. Lat. 29° 55′ S.; long. 71° 20′ W. Distance from London, 8961 miles *viâ* Magellan. Pop. (1895), 7322.

**Port Accommodation.**—No bar; no docks; vessels of any draught can anchor in 6 to 9 fathoms water. Discharging by lighters to railway co.'s sea wall (600 yards long), and custom-house wharf (300 yards long).
**Steam Communication.**—Cia. Sud-Americana from Valparaiso.
**Trade.**—Exports: copper and manganese ores, tanning materials, cattle, hides, rags, bones, &c. (1903), £190,580; imports are coal, textiles, mining and smelting machinery, &c., £282,300. B. C.

**Corea, or Korea.**—Area, including Quelpart I., 84,420 sq. m. Pop. about 10,000,000.

**Physical Features.**—Coast-line much indented; many islands off coast; interior mountainous, with a high ridge running from N. to S. along the E. side; valleys fertile; highest peak, 8700 ft.; well watered by numerous rivers flowing W.
**Climate.**—Subject to extremes of temperature, the thermometer ranging from 100° F. to below zero; average rainfall (June to September) about 20 inches.
**Resources and Production.**—Agriculture is in a backward state; the crops grown are rice, wheat, beans, barley, millet, oats, ginseng, tobacco, &c.; there is also some trade in silk, cattle, and hides; fishing is also engaged in. Gold is mined, and among the other minerals found are silver, copper, iron, and coal.
**Shipping and Railways.**—Chief port, Chemulpo, *q.v.*; other treaty ports are Fusan, Gensan, Mokpo, Chenampo, Kunsan, Masanpo, Songchin, Yongampo, and Wiju. Merchant fleet (1903), 3 steamers, of 2672 tons net. Vessels entered (1904), 7259, of 1,392,473 tons. Length of railways (1905), 688 m.
**Exports** (1904), £1,219,000. **Imports**, £2,736,000.

**Corfu,** port and coaling station, Ionian Is., Greece. Lat. 39° 73′ N.; long. 19° 57′ E. Distance from London, 2606 miles. Pop. (1896), 17,918.

**Port Accommodation.**—Good anchorage in 6 to 8 fathoms of water. Loading and discharging at quay (depth, 9 to 10 ft.), or by lighters. Small harbour for vessels up to 150 tons.
**Steam Communication.**—Rub. from Venice, Brindisi, &c.
**Trade.**—Exports: wine, olive-oil, valonia, soap, and hides, £177,000; imports: coal, iron, hardware, earthenware, textile fabrics, dried fish, provisions, &c., £264,000. B. C.

**Corinth Canal,** Greece, connects the Gulfs of Corinth and Ægina. Length, about 4 miles; bottom width, 72 ft.; depth, 26 ft. At NW. end is Posidonia, and at SE. end Isthmithia.

**Corinto,** port of Nicaragua on the Pacific. Lat. 14° 28′ N.; long. 87° 5′ W.; 35 miles by rail from Leon. Distance from Panama, 680 m. Pop. 3000.

**Port Accommodation.**—Available for steamers drawing 25 ft. Depth on bar, 22 ft. at low water. Loading and discharging by lighters.
**Steam Communication.**—Pacific Mail from San Francisco.
**Trade.**—Exports are coffee, fustic, hides, indiarubber, cedar, and hardwood; imports are iron, machinery, textiles, &c. British Consular Agent.

**Cork** (including **Queenstown**), port, naval and coaling station in S. of Ireland. Lat. 51° 48′ N.; long. 8° 15′ W. Distance from Liverpool, 249 miles; New York, 2835 m. Pop. (1901), parl. bor., 100,022.

**Port Accommodation.**—Harbour, about 4 m. long by 2 m. broad, entered by a channel 2 m. long by 1 m. broad. Quayage at Cork, 4670 ft.




Depths alongside at high water, 25 to 32 ft.; low water, 13 to 24 ft. Quayage at Queenstown, 600 ft.; depth at high water, 37 ft.; low water, 24 ft. Several private quays and quays for colliers at Cork and Queenstown. Quayage at Ballinacurra, 550 ft.; depth at high water, 12 ft. Patent slip and gridiron at Cork; 3 dry docks and gridiron at Queenstown.
**Trade.**—Exports: grain, cattle, daily produce, and provisions, &c. (1905), £5173; imports: general merchandise, £1,010,648.

**Coronel,** port and coaling station of Chile. Lat. 37° 1′ S.; long. 73° 9′ W.; 8534 miles from London *viâ* Magellan.

**Port Accommodation.**—Good anchorage in the open bay in 6 to 12 fathoms. Loading and discharging by launches. Railway facilities.
**Steam Communication.**—Kosmos line from London; P.S.N. Co. from Liverpool.
**Trade.**—Exports: chiefly coal from the mines of Colico, £375,600; imports: £180,000. B. V.-C.

**Costa Rica.**—Area, 18,690 sq. m. Pop. 331,400.

**Physical Features.**—The country lies between two depressions, and has a mountainous interior with numerous volcanoes; the N.E. coast is swampy; in the S.W. are extensive savannahs. Dense forests cover the highlands. The rivers are many, but few are navigable, and that for short distances by small vessels only.
**Climate.**—Temperature on coast (mean annual), 79° F.; up to 3000 ft., 76°; up to 8000 ft., 62°. In the SW. there is a dry season (Dec. to May), and a wet season (May to Nov.). Mean annual rainfall at San José (24 years), 64½ in.; the NE. is without a dry season. Thunderstorms reach their maximum in May. Earthquakes frequent.
**Resources and Production.**—Coffee and bananas are the chief agricultural products; exports of coffee in 1904–5, 355,246 cwts. Other products exported were hardwoods and dyewoods, rubber, tortoise-shell, &c. Maize, rice, and potatoes also grown. The live stock in 1892 embraced 345,665 cattle, 77,043 horses, and 2,765 sheep.
**Shipping and Railways.**—The chief ports are Puerto Limon and Punta Arenas. Vessels entered (1904), 609, of 683,812 tons. Length of railways open, 340 m.
**Exports** (1904), £1,368,000. **Imports**, £1,228,000. Exports to U.K. (chiefly coffee), £602,800; imports from U.K., £182,700.

**Crete.**—Area, 3330 sq. m. Pop. (1904), 310,400 (269,319 Christians; 33,496 Mohammedans).

**Physical Features.**—Mountainous, rising in Mount Ida to 8060 ft.; S. coast very rugged; fertile alluvial plains along N. coast.
**Climate.**—Healthy. Maximum summer temperature, 86.6° F.; mean winter, 44.4° F.; rainfall, 26¾ in.; snow falls on the higher peaks.
**Resources and Production.**—Agriculture is in a backward state; the chief products are olive-oil (largely used in the manufacture of soap), wine, dried currants, oranges, lemons, carob beans, chestnuts, valonia, mulberries, &c. Sheep and goats are numerous.
**Shipping.**—Chief ports are Candia, Canea, Suda Bay. Vessels entered (1904), 2225, of 1,208,785 tons; cleared, 2150, of 1,205,102 tons.
**Exports** (1905), £448,976. **Imports**, £607,400.

**Cronstadt,** port, naval and coaling station, Russia, on Kotlin I., Gulf of Finland. Lat. 59° 59′ N.; long. 29° 46′ E.; 20 miles W. of St. Petersburg. Distant from London, 1202 m.; Leith, 1266 m.

**Port Accommodation.**—The merchant's harbour can contain nearly 500 vessels of moderate size. Government graving docks. Ship canal, 16 m. long, to St. Petersburg; width, 207 ft.; depth, 22 ft.
**Trade.**—Exports: deals, lumber, hemp, tallow, hides, leather, cordage, &c.; imports: coal, petroleum, salt, sugar, cotton, dry goods, &c. B. V.-C.

**Cuba.**—Area, 45,880 sq. m. Pop. 1,573,000.

**Physical Features.**—The coast is much indented, and many small islands or keys lie off it; the surface of the interior is undulating plains and savannahs; in the E. it is mainly mountainous, rising in Pico Turquino to 8374 ft.; the W. part consists of hills and fertile valleys. Much of the surface is covered with forests, yielding valuable cabinet woods, such as mahogany, cedar, besides dyewoods, &c. There are many streams, but few navigable rivers; the Canta in the E. may be ascended by small ships for upwards of 50 m.
**Climate.**—Mean annual temperature at Havana, 77° F.; on the coast generally about 80°, with from 40 to 60 inches of rainfall. Rainy season May to October.
**Resources and Production.**—Tobacco and sugar are the staple products, but coffee, cocoa, cereals, potatoes, vegetables, and fruits are also cultivated. Sugar crop in 1904, 1,050,000 tons; rum exported (1903), 1,651,676 gallons. Tobacco exported in leaf, 40,977,946 lb.; number of cigars, 205,244,298; packets of cigarettes, 14,662,209. Copper, manganese, and iron mines are worked, about 50,000 tons of iron ore being sent monthly to the United States.
**Shipping and Railways.**—Principal ports, Havana, Cienfuegos, and Santiago de Cuba. Vessels entered (1904), 4320, of 8,361,097 tons, besides coasters, 12,292, of 2,820,331 tons. Length of railways open, 1479 m.
**Exports** (1904–5), £21,076,000. **Imports**, £19,366,000. Exports to Gt. Britain, £1,289,600; imports from Gt. Britain, £2,601,000.

**Curaçao,** a Dutch island off N. coast of Venezuela. Lat. 12° 6′ N.; long. 69° 5′ W. Distance from Jacmel, 425 miles; from Port-au-Prince, 638 m. Pop. 30,119

**Port Accommodation.**—Harbour at St. Anna Bay on S. coast; depth for vessels entering, 59 to 60 ft.; alongside quay, 41 to 42 ft.
**Steam Communication.**—D.W.I.M. from Amsterdam.
**Trade.**—Exports: orange peel, salt, phosphate of lime, alves, and goatskins (1904), £29,100; imports: coal, lumber, petroleum, cottons, woollens, and general goods, £226,600.

**Cuxhaven,** a port of Germany, at the mouth of the Elbe. Lat. 53° 52′ N.; long. 8° 43′ E.; 71 miles by rail NW. of Hamburg. Pop. (1900), 6898.

**Port Accommodation.**—Depth in Fischerhafen at high water of ordinary springs, 19.4 ft.; at entrance to Neuer Hafen, 32 ft. high water; 25 ft. low water; quayage, 4045 ft.; depth alongside at high and low water, 28 ft. and 21 ft. Two piers, each 395 ft. long, available at any state of the tide. Two common slipways, capable of lifting vessels of 300 tons.
**Trade.**—Fishing is carried on, and the port is used as the starting-point of the Hamburg-America line.

**Cyprus.**—Area, 3500 sq. m. Pop. (1901), 237,000.

**Physical Features.**—Traversed in N. and S. by two mountain chains, between which lies the broad fertile plain of Messaria; highest peak, Troodos, 6590 ft.; no navigable rivers.
**Climate.**—Mean annual temperature, 67° F.; hot on the coast; mean at

Larnaka (Nov. to March), 68.6°; (July and August), 87.8°; rainfall scanty, averaging only 18 inches.

**Resources and Production.**—The chief products are wheat, barley, oats, vetches, olives, grapes, carobs, cotton, fruit, linseed, silk, cheese, wool, hides, gypsum, terra-umbra, marble, copper, sponges, &c.

**Shipping.**—Chief port, Larnaka, *q.v.*

**Exports** (1905), £424,100. **Imports**, £430,500.

**Dahomey**, a French possession on the Gulf of Guinea, lying between Togoland and Lagos. Area about 65,000 sq. m. Pop. about 1,000,000.

**Physical Features.**—From a low and sandy coast, abounding in brackish lagoons, the coast rises in terraces towards the interior, much of which is covered with luxuriant vegetation.

**Climate.**—The atmosphere is damp and heavy, and malaria is prevalent. The temperature does not vary much, 86° F. In the north the air is drier.

**Production.**—Coco-nuts, butter-trees, and oil-palms are plentiful. Cereals, potatoes, bananas, &c., are grown. The mineral resources are not exploited.

**Shipping.**—The ports are Kotonou, Porto Novo, Grand Popo, &c., where steamers of the Chargeurs Réunis, Woermann, and B. & A.S.N. call. Railway into the interior 64 m. long.

**Trade.**—Exports (1905), £305,400; imports, £429,300.

**Dakar**, a fortified port of French Senegal. Lat. 14° 40′ N.; long. 17° 24′ W. Pop. (1901), 18,447.

**Port Accommodation.**—The harbour is being deepened, and is accessible to the largest vessels. Dry dock, 670 ft. long., under construction.

**Steam Communication.**—Woermann line from Hamburg.

**Trade.**—Exports: palm-oil, gums, wax, ivory, gold-dust, skins; imports: pe fumes, soaps, earthenware, paper, glass, wines, &c. B. C.

**Dalny** (now **Ta-lien**), a port of Manchuria, on E. side of Liao-tung Peninsula. Lat. 38° 55′ N.; long. 121° 30′ E.; 1263 miles from Hong-Kong. Pop. (1901), 50,000.

**Port Accommodation.**—Area of basin, 480 acres; depths from 18 to 28 ft. Good anchorage 3 miles out in 7 fathoms. Two dry docks. Railway facilities.

**Danzig**, a port, naval and coaling station, Germany, on the Vistula delta, 3 miles from the Baltic. Lat. 54° 20′ N.; long. 18° 38′ E.; 285 m. by rail NE. of Berlin. Pop. (1900), 140,565. Distance from London, *viâ* Kiel Canal, 767 m.; from Leith, 872 m; from Memel, 122 m.

**Port Accommodation.**—Depth at entrance, 23 ft.; as far as the Royal Dockyard, 22 ft.; at entrance to Neufahrwasser basin, 20½ ft. Good anchorage in roads in 5 to 6 fathoms.

**Steam Communication.**—Wilson line from Hull and Newcastle.

**Trade.**—Exports: beet, sugar, grain, seeds, timber, spirits, oils, oilcake, &c. (1905), £4,779,700; imports: coal, manures, chemicals, petroleum, herrings, salt, iron, &c., £6,237,750. B. C.

**Dar-es-Salaam**, a port of German E. Africa. Lat. 6° 50′ S.; long. 39° 20′ E. Pop. 13,000.

**Port Accommodation.**—Landlocked, spacious, well-sheltered harbour. Floating dock, 212½ ft. long.

**Steam Communication.**—D.O.A.L. from Hamburg.

**Delagoa Bay.** *See* **Lourenço Marques.**

**Deli (Belawan)**, a port in the N. of Sumatra. Lat. 3° 47′ N.; long. 98° 40′ E.

**Port Accommodation.**—Depth on bar at high water of ordinary springs and neaps, 13½ and 11 ft. The town is about 3 miles up the river, and the bar 2½ m. from the entrance to the river. Five piers, with not less than 12 ft. at low water ordinary springs and 20 ft. at high water. No docks or quays.

**Trade.**—Exports, tobacco.

**Demerara.** *See* **Georgetown.**

**Denmark.**—Area (including Faroe Islands), 15,390 sq. m. Pop. (1901), 2,464,800.

**Physical Features.**—The surface of all the islands is lowland, the highest point being reached in the Ejer Bavnehöj (565 ft.) on the E. coast of Jutland. The Faroe Islands are volcanic and mountainous with precipitous cliffs rising to 2000 ft. The rivers of Denmark are insignificant; the coast much indented by bays.

**Climate.**—Temperate; mean annual temperature of Copenhagen, 46.6° F. (Jan. 31°, July 63°); average rainfall, 21½ inches; the W. coast of Jutland visited by sea-fogs in summer.

**Resources and Production.**—Agriculture and dairy farming are actively engaged in, about 80 per cent. of the soil being productive. The chief cereal is oats of which 37,002,000 bushels were harvested in 1904, as well as 22,006,000 bushels of barley, and 23,465,000 bushels of potatoes. Large quantities of sugar beet are also grown, and the dairy farming is of great importance. In 1903 there were 486,935 horses, 1,840,465 head of cattle, and 876,830 sheep, besides goats and swine.

**Shipping and Railways.**—The principal ports are Aarhus, Esbjerg, Frederikshavn, Korsör, Odense; and in Faroe Islands, Thorshavn. Merchant fleet (1904), 592 steamers of 323,891 tons, and 3456 sailing vessels of 149,518 tons. Vessels entered (1904), 32,204 of 3,336,759 tons cargo. Vessels cleared, 34,312 of 1,057,256 tons cargo.

**Exports** (special, 1905), £21,692,777; to U.K., £15,416,456. **Imports**, £26,632,779; from U.K., £4,476,624.

**Desterro.** *See* **Florianopolis.**

**Devonport.** *See* **Plymouth.**

**Devonport**, a port on N. coast of Tasmania, near the mouth of the R. Mersey. Lat. 41° 9′ S.; long. 146° 22′ E. Pop. 3515.

**Port Accommodation.**—Depth on bar at low water, 16 ft.; average rise in tides, 10 ft. Total wharfage, 1700 ft., available at high water springs for vessels drawing 21 ft.

**Steam Communication.**—U.C. steamers to Melbourne and Sydney, and other lines.

**Trade.**—Exports, fruit and other produce.

**Diego Suarez**, bay, port in N. of Madagascar. Lat. 12° 13′ S.; long. 49° 23′ E.

**Port Accommodation.**—Well-sheltered basin, entered by a narrow but deep channel.

**Steam Communication.**—M.M. from Marseilles, Chargeur Réimis, &c.

**Trade.**—Exports: animals and animal products (1904), £19,073; imports: beverages, flour and meal, metals, &c., £200,183.

**Dieppe**, port and coaling station, France, on English Channel. Lat. 49° 55′ N.; long. 1° 5′ E.; 104 miles by rail from Paris. Pop. (1901), 22,839. Distance from Newhaven, 67 m.; Southampton, 113 m.

**Port Accommodation.**—Good anchorage in roads. Depth in entrance channel at ordinary springs and neaps, 36 ft. and 30 ft. Several docks with depths from 17 ft. at ordinary neaps to 36 ft. at highest springs. Quayage in avant-port and arrière-port, 3772 ft. Dry dock, 361 ft. long. Further improvements are proposed.

**Steam Communication.**—Daily by L.B. and S.C.R. steamers to Newhaven.

**Trade.**—Exports are fish, silks, wines, brandy, fruits, fancy goods, &c.; imports are coal, iron, machinery, pitch, and general merchandise. Value of trade, £13,720,000. B. V.-C.

**Dominica**, a British W. Indian island in the Leeward group. Lat. 15° 18′ N.; long. 61° 24′ W. Pop. (1901), 28,894. Distance from London, 3798 miles; Basse Terre, 45 m.; St. Pierre, 49 m.

**Port Accommodation.**—Open roadstead at Roseau, with anchorage in 15 to 25 fathoms. Loading and discharging by one-ton canoes. Harbour at Portsmouth, with anchorage in 3 to 10 fathoms.

**Steam Communication.**—R.M.S.P. from Southampton.

**Trade.**—Exports are cattle, sugar, molasses, rum, lime juice, coffee, and cocoa (1904), £63,000; imports are dry goods, wines, provisions, &c., £91,000.

**Dover**, a port on the SE. coast of Kent. Lat. 51° 7′ N.; long. 1° 18′ E. Pop. (1901), 41,782. Distance from Calais, 22 miles; Dunkirk, 42 m.; Ostend, 63 m.

**Port Accommodation.**—Depth in channel leading to Granville Dock at ordinary springs and neaps, 21 and 16 ft.; on sill, Granville Dock, 19 to 21 ft. and 15 to 17 ft.; Wellington Dock, 13 to 15 ft. and 9 to 11 ft. The new Commercial harbour encloses 71 acres, partly protected by the Admiralty Pier; accessible to largest vessels. Admiralty harbour enclosing 610 acres now under construction, and expected to be completed in 1907–8. Patent slip.

**Steam Communication.**—Mail steamers daily to Calais, Ostend, &c. Port of call for American and other liners.

**Trade**—Exports (1905), £3,764,000. Imports, £9,408,000.

**Drammen**, a port of Norway, on R. Drammen. Lat. 59° 45′ N.; long. 10° 12′ E.; 33 miles by rail SW. of Christiania. Pop. (1900), 23,093.

**Port Accommodation.**—Depth in outer harbour, 10 to 20 fathoms; inner harbour, 13½ to 19½ ft. Total quayage, 3781 ft.; depths alongside from 12 to 18½ ft. Patent slip.

**Trade.**—Exports: timber, wood pulp, ice, and pitch (1904), £878,000; imports, £346,000. B. V.-C.

**Drontheim** or **Trondhjem**, a fortified port and coaling station; Norway. Lat. 63° 24′ N.; long. 10° 27′ E.; 250 miles by rail N. of Christiania. Pop. 35,000. Distance from Leith, 648 m.; London, 906 m.: Bergen, 318 m.

**Port Accommodation.**—Anchorage in roads in 6 to 20 fathoms. Quayage in harbour, 10,670 ft.; depths in river and harbours from 14 ft. at low water to 26 ft. at high water. Two dry docks and a patent slip.

**Steam Communication.**—Wilson line from Hull.

**Trade.**—Exports: timber, dried fish, wood pulp, copper ore, tar, sulphur, &c. (1904), £781,000; imports: coal, salt, iron, corn, colonial produce, &c., £1,416,000. B. V.-C.

**Dublin**, a port and coaling station on R. Liffey, Ireland. Lat. 53° 21′ N.; long. 6° 16′ W. Pop. (1901), 290,638. Distance from Holyhead, 62 miles; Liverpool, 124½ m.; Belfast (by water), 112 m.

**Port Accommodation.**—Depth across bar at high and low water, 24 to 29 ft. and 11 to 16 ft.; at quays on river, 5 to 22 ft. (low water); Alexandra basin, 24 ft.; over sill (Custom House Docks) at high springs and neaps, 17½ and 13½ ft.; Spencer Docks, 12½ to 16½ ft.; Pigeons' House, 16½ and 13½ ft. (high water springs and neaps). Total quayage, 32,126 ft. Three dry docks, two patent slips, and a gridiron.

**Steam Communication.**—Daily services to Holyhead, Liverpool, Glasgow, &c.

**Trade.**—Largely a coasting one. Exports chiefly porter, whisky, cattle,

sheep, lambs, and pigs (1904), £78,090; imports: coal, sugar, grain, manure, timber, and general merchandise, £2,664,000.

**Dundee,** a port and coaling station, Scotland, on Firth of Tay, 10 miles from the North Sea. Lat. 56° 28′ N.; long. 2° 58′ W.; 59¼ m. by rail NNE. of Edinburgh. Pop. (1901), 161,173.

**Port Accommodation.**—Area of tidal basin, 4⅞ acres; high water entrance depth at ordinary springs, 20 ft.; highest springs, 21½ ft.; lowest neaps, 15 ft.; high water at quayside, 10 ft. Depths at quayside of fish dock, at high and low water, 27 and 12 ft.; highest springs and lowest neaps on sill (Earl Grey Docks), 19 and 12½ ft.; (King William IV. Dock), 16½ and 10 ft.; (Camperdown Dock), 23 ft. 2 in. and 16 ft. 8 in.; (Camperdown West Wharf), ordinary springs and neaps. 34 and 31 ft.; (Victoria Dock), 23 ft. 2 in. and 16 ft. 8 in. at highest springs and neaps. Ample quayage, two graving docks, and a patent slip.

**Steam Communication.**—By Dundee, Perth, and London Co., with London and other regular lines.

**Trade.**—Exports include jute manufactures, flax, sailcloth, sacking, marmalade, preserves, &c. (1905), £729,800; imports include raw jute, whale and seal oil, whalebone, esparto grass, china clay, &c., £1,928,000.




**Dunedin,** a port of South Island, New Zealand, on Otago Harbour, 16 miles from its entrance. Lat. 45° 52′ S.; long. 170° 31′ E.; 8 m. from Port Chalmers. Distance from London, *viâ* Cape Horn, 12,036 m.; from Sydney, 1239 m.; Melbourne, 1318 m.

**Port Accommodation.**—Depth at entrance at high and low water, 37 and 32 ft.; quayage, 5829 ft.; depth alongside (high water), 19¾ to 26 ft.; (low water), 15 to 20 ft. Dry dock.

**Steam Communication.**—U.C. to Melbourne, Sydney, Auckland, &c.

**Trade.**—Exports: gold, wool, timber, frozen meat, &c., £2,500,000; imports are clothing, hardware, tea, sugar, paper and general goods, £2,500,000.




**Dunkirk,** fortified seaport and coaling station in Nord Department, France. Lat. 51° 2′ N.; long. 2° 23′ E.; 189 miles by rail N. of Paris. Pop. (1901), 38,925. Distance from London, 113 m.; Hull, 210 m.; Leith, 364 m.; Glasgow, 712 m.

**Port Accommodation.**—Depth in entrance channel at ordinary spring and neap tides, 27 ft. 7 in., and 24 ft. 4 in.; in harbour, 26 ft. and 22.6 ft.; docks with depths down to 24 ft. Four dry docks, a slipway, a gridiron, and two pontoons.

**Steam Communication.**—Gibson line from Leith, Wilson line from Hull, and other steamers.

**Trade.**—Exports are sugar, phosphates, manures, rails, grain, flour, dried vegetables, potatoes, oil, machinery; imports: coal, iron, guano, wool, jute, flax, cotton, timber, petroleum, &c. Trade in 1904, £30,200,000. B. C.

**Durban (Port Natal),** seaport and naval coaling station, Natal, on a land-locked bay. Lat. 29° 52′ S.; long. 31° 2′ E. Pop. (1902), 57,000. Distance from London, 6993 miles; Cape Town, 812 m.; Delagoa Bay, 300 m.

**Port Accommodation.**—Shifting bar, but extensive harbour improvements now in progress. Average depth across bar (1903), 21 ft. 3½ in. at low water, equal to about 27 ft. 3½ in. at high water ordinary spring tides, and 25 ft. 3½ in. at neap tides. Quayage, 6586 ft. Floating dock and two patent slips.

**Steam Communication.**—U.C. from Southampton, Aberdeen line from London, and other lines.

**Trade.**—Exports: sugar, gold, tea, coffee, ivory, hides, horns, tanning materials, feathers, &c.; imports: manufactured goods and general merchandise.

**Dutch Guiana,** or **Surinam.** This Dutch colony lies on the N. coast of South America between British aud French Guiana. Area, 49,840 sq. m. Pop. 91,000.

**Physical Features.**—The coastal region is a fertile alluvial plain, generally flooded in the rainy season; behind it the country rises in terraces to the mountains beyond, and is covered by dense forests of valuable timber. The Tumuc-Humac mountains are in the S. Besides the Corentyne and Maroni, the principal rivers are the Nickerie, Coppename, and Saramacca.

**Climate.**—Hot and humid; mean annual temperature at Paramaribo, 81° 56′; highest temperature, 87° 76′; lowest, 74° 21′ F. Rainy season from middle of April to middle of July; dry season, July to November.

**Resources and Production.**—Cultivation is confined to the coastal belt, and the chief products are sugar (1902), 12,837 tons; cocoa, 2152 tons; bananas, 555,718 bunches; rice, 368 tons; maize, 550 tons; coffee, 4727 cwts.; rum, 224,086 gallons; molasses, 255,462 gallons. Gold production in 1902, 18,803 oz. Timber and the juice of the balata tree are also exported.

**Shipping and Communication.**—Railway 50 m. long; intercommunication is chiefly by small steamers. Vessels entered and cleared, 1806 of 661,500 tons.

**Exports.**—(1905), £369,131; to U.K., £597. **Imports.**—£546,443; from U.K., £41,314.

**East London,** port at the mouth of the Buffalo R., Cape Colony. Lat. 33° 2′ S.; long. 27° 55′ E. Pop. (1904), 24,054. Distance from Southampton, 6537 miles; 558 m. (sea) from Cape Town; and 254 m. from Durban.

**Port Accommodation.**—Depth on bar at high water ordinary springs and neaps, 24½ and 22½ ft. Length of Harbour Board wharves, 3832 ft. Vessels drawing 20 ft. can lie alongside wharves; larger vessels anchor in roadstead. Patent slip.

**Steam Communication.**—U.C. from Southampton, &c.

**Trade.**—Exports: wool, mohair, hides, gold, &c. (1904), £1,124,500; imports, textile goods and general merchandise, £4,344,000.

**Ecuador.**—A republic on the Pacific coast of South America traversed by the Equator. Area, 115,700 sq. m. Pop. 1,272,000.

**Physical Features.**—The country is traversed by the Andes which divide it into three zones, the coastal, that of the Cordilleras and their basins, and that of the Amazonian Plains. There are many volcanoes, that of Sangay being one of the most active in the world. The rivers of the W. slope are the Mira, Cayapas, the Esmeraldas, or Perucho, rising on a plateau at the foot of Cotopaxi, the Chones, the Charapoto, the Guayas, the Jubonis, and the Tumbes; the rivers of the E. slope belong to the basin of the Amazon, among them are the Santiago, Morona, Pastasa, Chambira, Tigre, Nanay, Napo, and Putumayo.

**Climate.**—There are two seasons in Ecuador: the summer, or dry season, lasting from May to October; and the winter, or wet season, from October to May. Temperature varies with elevation; it is tropical on the coast, temperate in the high region of the plateaus; in Quito the mean annual is about 56°. Much rain falls in the coastal region of the N. and in the forests of the E. slope; the rainfall at Quito is 40 inches.

**Resources and Production.**—Ecuador is the chief producer of cocoa, the crop in 1904 amounting to 28,433 tons. The amount of coffee grown in the same year was 3434 tons. Among other vegetable products are sugar, rubber, Brazil nuts, cotton, Peruvian bark, orchilla, and ivory nuts. The country is rich in metals and minerals, and gold is extracted. A large trade is also done in Panama hats, most of which are made in Ecuador.

**Shipping and Railways.**—The principal Ecuadorean ports are Guayaquil and Esmeraldas. There entered at the ports in 1904, 2458 vessels of 56,063 tons, and there cleared 1210 vessels of 66,697 tons. Navigation is carried on by side-wheel and screw steamers, and a fleet of canoes on the inland waters. The length of railway open in 1904 was 168 miles. The line is not yet extended to Quito.

**Exports** (1904), £2,328,000; to U.K., £158,600. **Imports,** £1,534,000; from U.K., £331,400.

**Egypt.**—Total area (exclusive of Sudan), 400,000 sq. m.; of settled land surface, 10,381 sq. m. Pop. (1897), 9,734,405. Area of Anglo-Egyptian Sudan, 950,000 sq. m. Pop. estimated at 2,000,000.

**Physical Features.**—The fertile area is confined to the Nile valley and low-lying delta, separated on either side by hill ranges from the Libyan Desert with its oases on the W. and the mountainous plateau of the Arabian Desert on the E.; the Sinai peninsula in Arabia Petræa is rocky and mountainous. The plateau formation continues into the Sudan.

**Climate.**—Hot, but healthy, except for Europeans in parts of the Soudan. Mean winter and summer temperature of Cairo, 57° and 84° F.; the hot S. Khamsin wind of May and June sometimes raises the temperature in Upper Egypt to over 140° F. The rainfall is infinitesimal, its place being taken by heavy dews.

**Resources and Production.**—Agriculture has been greatly advanced by the recent erection of reservoirs and dams; the year has three seasons or crops; in winter, cereals of all kinds are sown; in summer, cotton, sugar, and rice; and in autumn, rice, maize, millet, and vegetables. In Lower Egypt, the chief crops are rice, Indian corn, wheat, barley, clover, cucumbers; in Upper Egypt, cereals, vegetables, cotton, and sugar-cane; lands irrigated in flood are under millet. The date palm is largely cultivated, there being about 5½ million trees. The forests of the Sudan yield fibres, gums, rubber, bamboo, tanning materials, &c. Acres under wheat, 1,273,839; maize, 1,792,314; cotton, 1,372,485; sugar-cane, 74,859.

**Shipping and Railways.**—Chief ports, Alexandria, Port Said, and Suez. Vessels entered at Alexandria (1904), 4021 of 3,207,991 tons; cleared, 4021 of 3,201,472 tons. Vessels passing through Suez Canal (1905), 4116 of 13,134,105 net tonnage, of which 2484 of 8,356,940 tons were British. Railways open: State, 1688 miles; private, 780 miles; military to Sudan, 776 miles, Berber and Port Sudan, about 312 m.

**Exports** (1905), £20,322,000, of which £10,832,000 were to the U.K. **Imports:** £21,421,000, of which £7,335,600 were from the U.K.

**Emden,** a port and coaling station of Germany, on the Ems estuary. Lat. 53° 22′ N.; long. 7° 13′ E.; 48 miles by rail NE. of Oldenburg. Pop. (1900), 16,453. Distance from Leith, 402 m.

**Port Accommodation.**—Depth in outer harbour now 37½ ft. Works are in progress to convert Emden into a great seaport. Six slipways.

**Trade.**—Exports: corn, coals, coke, &c; imports: coal, iron, timber, rye, and general goods. B. V.-C.

**Esbjerg,** port of Denmark in S.W. of Jutland. Lat. 55° 27′ N.; long. 8° 27′ E. Pop. (1901), 13,355. Distance from Grimsby, 320 miles; Harwich, 338 m.

**Port Accommodation.**—Depth over sill in wet dock, 18 ft.; quayage, 2600 ft.; depth of high and low water in tidal harbour, 15 to 19 ft. and 10 to 14 ft.; quayage, 2000 ft.; depth in fishing harbour, 18 ft.; quayage, 1300 ft.

**Steam Communication.**—United S. Co. of Copenhagen from Harwich.

**Trade.**—Exports: cattle, bacon, fish, eggs, butter, hides, &c.; imports: coal, grain, meal, manures, oil-cake, and general merchandise. B. V.-C.

**Falkland Islands.**—Area (with South Georgia), 7500 sq. m. Pop. 2100.

**Physical Features.**—The surface is mostly undulating grass and bog-land reaching its highest point in Mount Adam (2315 ft.).

**Climate.**—Temperate and healthy. Mean annual temperature, 47° 2′ F. (summer, 53° 3′; winter, 39° 9′); mean rainfall, 29 in.

**Resources and Production.**—Sheep farming is the chief industry, and the exports consist of wool, skins, and tallow. Number of sheep, 681,209; cattle, 4500; horses, 3000; pigs, 400.

**Shipping.**—Vessels entered (1904), 60 of 119,651 tons; cleared, 59 of 117,491 tons. The port is Port Stanley.

**Exports** (1905), £167,450; to U.K., £167,039. **Imports**, £58,155; from U.K., £52,218.

**Faroe Islands.** *See* **Thorshavn.**

**Fayal,** island, port and coaling station in the Azores. Lat. 38° 30′ N.; long. 28° 42′ W. Pop. 26,264. Distance from Gibraltar, 1137 miles; Liverpool, 1390 m.; London, 1578 m.

**Port Accommodation.**—Good anchorage in Horta Bay for vessels of largest size. Ample quayage inside breakwater. Mooring buoys in break-water basin in 6 fathoms.

**Steam Communication.**—Regular sailings by Portuguese line from Lisbon.

**Trade.**—Exports: maize, dairy produce, hides, &c.; imports: textiles, hardware, haberdashery, &c. B. V.-C.

**Fécamp,** a port and coaling station of Seine-Inférieure, France, on the English Channel. Lat. 49° 45′ N.; long. 0° 22′ E.; 27 miles by rail NE. of Havre. Pop. (1901), 15,381. Distance from Southampton, 97 m.

**Port Accommodation.**—Entrance channel being dredged to depth of 32 ft. Quayage about 7000 ft. Depths at high springs and neaps (Old Tidal Harbour), 27 and 20 ft.; (Bérigny Dock), 30 ft. 10 in. and 25 ft. 8. in.; (New Dock), 28 ft. 11 in. and 24 ft.; (New Tidal Harbour), 29 and 22 ft. Gridiron.

**Trade.**—Exports are Benedictine liqueur (£148,219 in 1905), oil-cake, salt, flour, &c.; imports: coal, timber, wheat, rapeseed, ground nuts, cod-fish, &c. B. V.-C.

**Fernando Po,** island with port and coaling station (Santa Isabel), belonging to Spain, in Gulf of Guinea, W. Africa. Lat. 3° 46′ N.; long. 8° 48′ E. Pop. (1900), 20,741. Distance from Liverpool, 4377 miles.

**Port Accommodation.** — Vessels anchor 200 yards from shore in 10 fathoms, and discharge by surf boats. No docks.

**Steam Communication.**—Elder-Dempster line from Liverpool.

**Trade.**—Exports: coffee, cacao, palm-oil, yams, &c.; imports: coal. B. C.

**Fiji.**—Area (including Rotumah), 7435 sq. m. Pop. (1903), 121,100.

**Physical Features.**—Of volcanic origin, wooded, fertile, and well-watered.

**Climate.**—Equable and healthy; average shade temperature in cool season, 72° F., rising to 84° in the hot season; extremes between 60° and 94°; rainfall about 100 inches on the windward side.

**Resources and Production.**—Soil suitable for nearly all kinds of vegetable products; chief crops: bananas, cocoa-nuts, maize, sugar-cane, yams, tobacco, peanuts, tea, rice, pine-apples, and other fruits; colonial distilled spirit, turtle-shell, pearl-shells, and bêche-de-mer are exported.

**Shipping.**—The chief ports are Suva and Levuka. Vessels entered (1904), 140 of 183,761 tons.

**Exports** (1904), £590,000; to U.K., £24,900. **Imports**, £440,000; from U.K., £36,700.

**Finland.**—Area, 144,260 sq. m. Pop. (1903), 2,816,300.

**Physical Features.**—Coast much indented, and studded with islands, interior an undulating table-land with numerous lakes; much bog and marsh land; large part under forests.

**Climate.**—Long severe winters, and short hot summers. Mean annual rainfall at Helsingfors, 22.2 inches.

**Resources and Production.**—The crown forests occupy about 57 per cent. of the total area, and bring in a large income. The cultivable area is divided into a large number of small farms, the crops grown being wheat, rye, barley, oats, flax, hemp, and potatoes; cattle rearing is also actively pursued, and there is a brisk trade in dairy produce.

**Shipping and Railways.**—The chief ports are Helsingfors, Åbo, Björneborg, and Vasa. Merchant fleet (1905), 344 steamers of 56,663 tons, and 2465 sailing vessels of 289,532 tons. Vessels entered (1904), 9466 of 2,699,338 tons; cleared, 9223 of 2,625,968 tons. Length of railways (1905), 2067 miles.

**Exports** (1904), £8,624,000; to U.K., £2,560,000. **Imports**, £10,684,000; from U.K., £1,072,000.

**Fiume,** seaport and coaling station of Hungary, at the head of the Gulf of Quarnero. Lat. 45° 19′ N.; long. 14° 26′ E.; 375 miles by rail SW. of Budapest. Pop. (1900), 38,955. Distance by sea from London, 2965 m.; from Trieste, 110 m.; Port Said, 1257 m.

**Port Accommodation.**—Largest vessels can lie alongside quays. Depth at entrance to Porto Grande, 18 fathoms; wharfage, 8924 ft.; depths alongside from 9⅞ to 24½ ft.; wharfage (Porto Gabriele Baross), 4134 ft.; depth alongside, 21 to 24½ ft.; quayage (Fiumara), 3182 ft.; mean depth alongside, 14⅞ ft.; petroleum quay, 1935 ft. long. Floating dock, 131 ft. long.

**Steam Communication.**—Wilson line from Hull, Adria line, A. L.

**Trade.**—Exports: grain, flour, beans, rice, sugar, tobacco, chemicals, paper, oak staves, &c. (1905), £7,017,000; imports include petroleum rice, iron, hardware, cotton goods, jute, chemicals, &c., £5,305,000. B. C.

**Flensburg,** a port of Schleswig-Holstein. Lat. 54° 47′ N.; long. 9° 26′ E.; 110 miles by rail NNW. of Hamburg. Pop. (1900), 48,922.

**Port Accommodation.**—Vessels of largest draught can reach the port. Quayage, 3000 ft.; depth alongside, 14.20 feet. Offshore dock, 280 ft. long.

**Trade.**—Exports: bricks, tiles, spirits, beer, oil, &c.; imports: coal, grain, iron, slates, salt, palm kernels, petroleum, &c. B. V.-C.

**Florianopolis** (formerly **Desterro**), a port of Brazil, and capital of Santa Catharina. Lat. 27° 35′ S.; long. 48° 30′ W. Pop. 30,000.

**Port Accommodation.**—Depth in port, 3 fathoms at low water. Vessels drawing 21 ft. will reach the city anchorage when channel is cut through bar, which has only a maximum depth of 13½ ft. Vessels of 28 ft. draught can reach bar, which is 5 miles from anchorage.

**Trade.**—Exports: coffee, sugar, rice, vegetables, dairy produce, &c. (1904), £87,000; imports, £167,000. B. V.-C.

**Flushing,** fortified seaport and coaling station, Holland, on Walcheren I., at the mouth of the W. Scheldt. Lat. 51° 26′ N.; long. 3° 34′ E. Pop. (1899), 18,893. Distance from Queenborough, 109 miles.

**Port Accommodation.**—Quayage of outer harbour, 3000 ft.; depth at high and low water, 34.4 ft. and 22.4 ft.; quayage of inner docks, 7000 ft.; depth over sill at ordinary springs and neaps, 27 and 25 ft. Dry dock, 243 ft. long.

**Steam Communication.**—Zeeland line from Queenborough.

**Trade** mainly a forwarding one. Exports are fish, mussels, shrimps oysters, agricultural and dairy produce, margarine, &c.; imports are coal, petroleum, wheat, timber, &c. B. V.-C.

**Folkestone,** a port in SE. Kent, on English Channel. Lat. 51° 5′ N.; long. 1° 12′ E.; 17 miles SE. of Canterbury. Pop. (1901), 30,650. Distance from Boulogne, 26 m.

**Port Accommodation.**—Tidal harbour. Spring and neap high water depths at entrance, 18 and 13 ft.; depth at quayside at high water springs, 14 ft. Gridiron.

**Steam Communication.**—Daily with Boulogne.

**Trade.**—Exports: skins and furs, cotton goods, &c. (1905), £2,000,600; imports: silk and woollen goods, leather, clothing, &c., £10,432,000.

**Formosa.** *See* **Kelung.**

**France.**—Area, 207,100 sq. m. Pop. 39,000,000.

**Physical Features.**—Greater part of the surface elevated plain; highest mountains on the S. and E. borders, culminating in Mont Blanc, 15,775 ft.; watered by numerous rivers, many of which are navigable, the chief being the Seine, Charente, Loire, Garonne, Adour, Rhône, Meuse, Somme, and the Moselle.

**Climate.** — Salubrious. Mean temperature in January of Marseilles, 44.6° F., of Bordeaux, 42.8° F., of Nancy, 33.8° F.; mean annual of S. France, 59°; Central France, 55.4°; N. France, 50°. Rainfall abundant.

**Resources and Production.**—Of the total area about 16 per cent. is under forests, and about 69 per cent. under all kinds of crops, fallow, and grasses. The chief crops in 1905 were wheat, 328,314,000 bushels; oats, 263,908,000 bus.; rye, 58,404,000 bus.; and wine, 1,246,652,000 gals. Of coal and lignite, 35,469,000 tons were extracted. In 1904 the total value of the mineral production was £20,096,000.

**Shipping and Railways.**—The principal ports are Boulogne, Calais, Cette, Cherbourg, Dieppe, Dunkirk, Havre, La Rochelle, Marseilles, Nice, St. Nazaire, Toulon, &c. Merchant fleet (1904), 1383 steamers of 585,132 tons, and 14,910 sailing vessels of 650,209 tons. Navigation at French ports in 1903: 89,814 French vessels of 12,710,699 tons, and 20,527 foreign vessels of 14,855,955 tons. Railways open at end of 1905, 24,743 miles.

**Exports** (special, 1905), £190,468,000; to U.K., £53,072,900. **Imports**, £186,956,000; from U.K., £23,232,900.

**Frederikshald,** a port of Norway. Lat. 59° 7′ N.; long. 11° 24′ E.; 85 miles by rail SSE. of Christiania. Pop. (1900), 11,936. Distance from London, 662 m.; Newcastle, 496 m.

**Port Accommodation.**—Depths at high water, Raadsbryggen, 14 to 25 ft.; Bratö, 25 to 30 ft.; between Kuskjær and Saugö, 50 to 62 ft.; (inner harbour), 10 to 20 ft.; Nyhavn, 18 ft.; (Custom House quay), 9 ft.; (other basins) 10 to 20 ft.

**Trade.**—Exports: timber, fish, and granite (1904), £291,000; imports: coal, grain, and cotton, £237,800. B. V.-C.

**Frederikshavn,** a port of Denmark, on the Kattegat. Lat. 57° 27′ N.; long. 10° 33′ E.; 36 miles NE. of Aalborg. Pop. (1901), 6538. Distance from London, 625 m.; Newcastle, 456 m.

**Port Accommodation.**—Good anchorage in outer harbour; depth at entrance, 22⅜ ft. Quayage, 4000 ft.; depth alongside, 10 to 22 ft.

**Trade.**—Exports: grain, cattle, fish, dairy produce, &c.; imports: coal, iron, wood, and salt. B. V.-C.

**Fredrikstad,** a port of Norway, at the mouth of the Glommen. Lat. 59° 12′ N.; long. 10° 58′ E.; 58 miles by rail S. of Christiania. Pop. (1900), 14,573. Distance from London, 653 m.; the Tyne, 493 m.

**Port Accommodation.**—Depth in E. entrance, 23 ft.; W. entrance, 24⅜ ft.; alongside quays, 15 to 16 ft. Vessels of large draught can discharge ballast at Lera, 1½ m. away.

**Trade.**—Exports: timber, stone, and bricks (1904), £889,000; imports: chiefly coals, £153,000. B. V.-C.

**Fremantle,** port and coaling station, Western Australia, at mouth of the Swan R. Lat. 32° 3′ S.; long. 115° 45′ E.; 12 miles SW. of Perth. Pop. 24,000. Distance from London, *viâ* Suez, 9537 miles; Colombo, 3120 m.; Cape Town, 4708 m.

**Port Accommodation.**—Bar at entrance dredged away, leaving a depth of 30 ft. available at low water. Deep water area of harbour, 96½ acres; heavy moorings and buoys in basin. Depth at Victoria Quay, N. Quay, and N. Wharf, 30 ft. at low water. Anchorage in Gage Roads in 6 to 12 fathoms. Dry dock, 610 ft. long, and patent slipway.

**Steam Communication.**—Orient, N.D.L. from Southampton, and other lines.

**Trade.**—Exports are gold, sandalwood, copper and lead ores, gum, wool, pearl shell, manna, cattle, &c.; imports: coal and general merchandise. Total trade, £13,098,000.

**French Congo.**—Area, 450,000 sq. m. Pop. 10,000,000.

**Physical Features.**—The surface is composed of plain, mountain, valley, and dense tropical forest, watered by several large rivers.

**Climate.**—Unhealthy for Europeans, especially on the coast, where the temperature rarely exceeds 95° F. or falls below 68° in the shade. Rainy season from middle of September to middle of May.

**Resources and Production.**—Fertile soil. Country hardly yet exploited, but promises to be rich in forest products, gold, copper, and iron. Coffee,

vanilla, and cocoa are grown by Europeans, and the chief exports are rubber, ivory, various woods, palm oil and kernels, kola nuts, piassava, &c.

**Shipping and Railways.**—The principal port is Loango, Libreville being inaccessible for large vessels. Railway to connect Libreville with the Congo projected.

**Exports** (1904), £485,400. **Imports**, £362,300.

**French Guiana.**—French Guiana, or Cayenne, lies on the NE. coast of S. America, and is bounded on the N. by the Atlantic, on the W. by Dutch Guiana, and on the S. and E. by Brazil. Area, 30,463 sq. m. Pop. (1901), 32,908. Cayenne and the Iles du Salut form a convict settlement.

**Constitution and Government.**—Administered by a Governor and Privy Council, a Council General of sixteen members, and represented in the French Parliament by a Deputy.

**Physical Features.**—The coast is higher than in British and Dutch Guiana, but the surface presents the same features. Besides the Maroni on the W., and the Oyapok on the E., the other rivers are the Aprouague, Cayenne, Sinnamarie, and Mana, all obstructed by falls. The climate is hot and moist.

**Resources and Production.**—Only about 8800 acres are under cultivation, and the crops are rice, maize, manioc, cocoa, coffee, sugar-cane, indigo, and tobacco. Gold, silver, phosphates, and iron are worked; gold produced in 1903, 136,170 oz.

**Exports** (1904): cocoa, phosphates, wood, hides, gold, &c., £608,246. **Imports** (1904): £434,648. Chief port, Cayenne, *q.v.*

**French Guinea.**—Area, 95,000 sq. m. Pop. estimated at 2,200,000.

**Resources and Production.**—Chief products: indiarubber, palm-oil and nuts, millet, earth-nuts, gum, and coffee. Experimental garden at Konakry, where the culture of bananas, pine-apples, and other plants is being tried. Numerous cattle, sheep, goats, and some horses, asses, and mules in Futa Jallon. Minerals but little exploited; some gold in Bouré and Siké districts.

**Shipping and Railways.**—Chief port, Konakry. Railway constructed as far as Kindia, 83 miles.

**Exports** (1904), £547,000. **Imports**, £592,000.

**French India.**—Consists of five towns, Pondichéry, Karikal, Chandernagar, Mahi, and Yanaon. Total area, 196 sq. m. Pop. 273,748.

**Resources and Production.**—The chief crops are paddy, ground-nut, and ragi. Manufactures, cotton (4 mills), and jute (1 mill).

**Exports** (1905), £1,087,440. **Imports**, £254,240.

**French Somaliland.**—Area, 12,000 sq. m. Pop. 50,000.

**Resources and Production.**—The chief source of wealth is the export of ivory, wax, coffee, and living animals; there are also coast fisheries.

**Shipping and Railways.**—The port is Jibutil, *q.v.* Railway open from Jibutil to Harrar (Dire-Dawah), about 200 miles.

**Exports** (1905), £728,760. **Imports**, £477,200.

**Funchal.** *See* **Madeira.**

**Gabun**, an inlet with port in the French Congo, W. Africa. Lat. 0° 25′ N.; long. 9° 19′ E.; 4478 miles from London.

**Port Accommodation.**—Well-sheltered anchorage in the estuary for the largest vessels.

**Steam Communication.**—Woermann line from Hamburg.

**Trade**.—Exports: ivory, ebony, wax, rubber, copal, &c.; imports: cotton, dry goods, rum, and tobacco.

**Galatz**, river-port and coaling station, Roumania, at the junction of the Pruth with the Danube. Lat. 45° 26′ N.; long. 28° 2′ E. Pop. (1899), 62,678. Distance from London, 3460 miles; Liverpool, 3660 m.

**Port Accommodation.**—Quayage of basin, 1640 ft.; depth alongside varies from 42 ft. 7 in. in May and June to 15 ft. in October and November. Quayage alongside river, 2660 ft., available for vessels drawing 24 ft. Three floating docks.

**Steam Communication.**—Rub. from Genoa, &c.

**Trade.**—Exports: grain, meal, tallow, lard, hides, wool, &c.; imports: coal, iron, tobacco, dried fruits, sugar, &c. B. C.-G.

**Galle (Point de Galle)**, port and coaling station, on SW. coast of Ceylon. Lat. 6° 1′ N.; long. 80° 14′ E.; 66 miles SE. of Colombo. Pop. (1901), 37,248. Distance from London, 6759 m.

**Port Accommodation.**—Good anchorage in 33 ft. at low water in outer berths, and in 24 ft. in inner harbour. Discharging done by cargo boats for which there are three jetties.

**Trade.**—Exports: tea, coffee, cocoa-nuts, plumbago, grass-oils, &c.; imports: rice, coal, &c.

**Gallipoli**, a port of Turkey, at E. end of the Dardanelles. Lat. 37° 0′ N.; long. 28° 17′ E.; 90 miles S. of Adrianople. Pop. about 30,000.

**Port Accommodation.**—Sheltered anchorage for largest vessels in 11 fathoms ½ mile off shore.

**Trade.**—Exports: cereals, aniseed, linseed, onions, sponges, goat's hair, skins, oil, &c.; imports: cloth, calicoes, leather, iron, hardware, tobacco, petroleum, coffee, sugar, rice, &c. B. V.-C.

**Galveston**, port and coaling station, Texas, on island at mouth of Galveston Bay. Lat. 29° 17′ N.; long. 94° 50′ W. Pop (1900), 37,789. Distance from Liverpool, 4882 miles; New York, 1893 m.; Havana, 765 m.

**Port Accommodation.**—Depth on bar at high and low water ordinary springs, 27 and 24 ft.; at extreme high water 29 ft. Harbour area with depth of 30 ft., 460 acres; depth of 24 ft., 1300 acres. Several wharves on Galveston Bay with 25 to 30 ft. water. Warehousing and railway facilities. Marine railway for vessels up to 1000 tons.

**Trade.**—Exports are chiefly cotton, hides, wool, tallow, and oil (1905), £30,951,000; imports include coal, salt, coffee, earthenware, and general merchandise, £1,244,000. B. C.

**Gambia.**—Area of colony, 69 sq. m. Pop. (1901), 13,456. Area of protectorate, 3000 sq. m. Pop. 150,262.

**Physical Features.**—The surface of the colony proper is low and swampy, and unhealthy for Europeans during rainy season (June to October).

**Climate.**—Mean temperature ranges from 60° to 85° F.; rainfall, 49 in.

**Resources and Production.**—The chief products are ground nuts, bees-wax, rice, millet, sweet potatoes, cotton, and rubber.

**Shipping.**—Chief town and port, Bathurst, *q.v.*

**Exports** (1905), £280,270; to U.K., £17,810. **Imports**, £305,180; from U.K., £113,398.

**Gateshead.** *See* **Newcastle-on-Tyne.**

**Geelong**, a port of Victoria, on Corio Bay, a W. arm of Port Phillip Bay. Lat. 38° 9′ S.; long. 144° 22′ E.; 45 miles SW. of Melbourne. Pop. (1901), 12,399.

**Port Accommodation.**—Good anchorage in the landlocked bay. Harbour approached by the old channel, 18 ft. deep, and the new (Hopetoun) channel, 23 ft. deep. Wharfage, 2980 ft., with 17 to 20 ft. of water.

**Trade.**—Exports: wool, hides, preserved meats, potatoes, &c.; imports: coal, iron, spirits, and general merchandise.

**Gefle**, a port of Sweden, on an inlet of the Gulf of Bothnia. Lat. 60° 40′ N; long. 17° 7′ E.; 71 miles by rail NW. of Upsala. Pop. (1900), 29,522. Distance from Leith, 1102 m.; Stockholm, 146 m.; Riga, 332 m.

**Port Accommodation.**—Good anchorage in outer roadstead in 40 to 55 ft. Vessels drawing 21 ft. can enter outer harbour by N. channel, 22 ft. deep. Quayage at new harbour (Nyhamn), 700 ft.; depth alongside, 21½ ft. Two slips for vessels of 50 tons and 1500 tons gross.

**Trade.**—Exports: wood, wood-pulp, bar-iron, cellulose, grain, &c.; imports: coal, salt, grain, &c. B. V.-C.

**Genoa**, fortified port and coaling station of N. Italy, on Gulf of Genoa. Lat. 42° 24′ N.; long. 8° 54′ E.; 94 miles by rail S. of Milan. Pop. (1901), 234,710. Distance from London, 2161 m.; Gibraltar, 853 m.; Naples, 355 m.

**Port Accommodation.**—Harbour at present being greatly enlarged. Length of quayage and 12 jetties, 23,000 ft.; depth alongside, 29½ ft. Cumogli harbour (10 miles E. of Genoa), depth at entrance to inner harbour, 15 ft.; outer harbour, 6 fathoms. Depth in Portofino harbour, 19 to 29 ft.; quayage, 1505 ft. Three dry docks and a steel floating dock.

**Steam Communication.**—Anchor line from Glasgow; N.D.L. from Southampton, and others.

**Trade.**—Exports: silks, cottons, wine, olive oil, paper, hats, flax, jute, hemp, rice, vermicelli, cheese, furniture, marble, fruits, vegetables, &c.; imports: coal, machinery, wheat, grain, silk, chemical products, dye stuffs, hides, sugar, mineral oils, spirits, coffee, iron, china clay, bricks, tiles, &c. The most important port of Italy. B. C.




**Georgetown (Demerara)**, port of British Guiana, at mouth of the Demerara R. Lat. 6° 50′ N.; long. 58° 12′ W. Pop. (1891), 53,176. Distance from London, 4075 miles; Liverpool, 3922 m.; Barbadoes, 385 m.

**Port Accommodation.**—Anchorage on mud and stiff clay. Depth on bar at ordinary springs and neaps, 18 ft. and 16 ft.; high and low water in port, 32 ft. and 23 ft. Discharging at private wharves or by lighters. Dry dock 212 ft. long; and patent slipway, 295 ft. long.

**Steam Communication.**—Demerara and Berbice line from London, R.M.S.P. from Southampton, R.D.W.I.M. from Amsterdam, &c.

**Trade.**—Exports: sugar, molasses, rum, coffee, cocoa, hardwood, old iron, copper, &c.; imports: coal, provisions, and manufactured goods.

**German East Africa.**—Area, 365,450 sq. m. Pop. 6,700,000, including 1437 Europeans.

**Physical Features.**—Near the coast the surface is low-lying and flat; the interior is mountainous plateau, with many high isolated peaks (Kilimanjaro, 19,720 ft.); its N., W., and S. borders touch on the great lakes, Victoria, Tanganyika, and Nyasa.

**Climate.**—Hot and unhealthy on the coast lands; more bracing in the interior, but unsuited to European colonisation.

**Resources and Production.**—Much of the surface is under forests; near the coast grow mangroves, coco-palms, baobabs, tamarinds, fibre plants, &c. Agriculture is also pursued, the products being pulse, maize, &c.; tobacco, tea, coffee, sugar, caoutchouc, cardamoms, chinchona, cacao, and vanilla are also cultivated; cattle-rearing, and sheep and goat farming are also carried on. Several minerals are known to exist in the country.

**Shipping and Railways.**—Chief ports, Dar-es-Salaam, and Bagamoyo. Railway line open, 93 miles.

**Exports** (1905), £497,500. **Imports**, £943,900.

**German Empire.**—Area, 208,830 square miles. Pop. (1900), 56,367,178.

**Physical Features.**—The surface slopes from the highlands of the Alps on the Swiss border to the plains of the north coast, with the central mountain ranges lying between; it is intersected by numerous large, navigable rivers.

**Climate.**—Temperate and healthy; mean annual temperature at Berlin, 48.5°, at Leipzig, 46.7°, at Munich, 45°, at Königsberg, 43.5° F.; average mean annual rainfall, 27 inches.

**Resources and Production.**—Ninety-one per cent. of the soil is classed as productive. In 1905 the crops harvested were: wheat, 135,909,000 bushels; rye, 352,891,000 bus.; barley, 128,800,000 bus.; and oats, 369,961,000 bus. The vineyards yielded 84,851,500 gallons of must, and a large quantity of sugar-beet is grown. There is a large growth of fruit, comprising apples, pears, plums, and cherries. Total value of minerals raised in Germany in 1905, £70,789,000, including coal and lignite,

£58,542,800, and iron-ore, £4,088,500; 10,811,000 tons of pig iron were manufactured. The industries of Germany are highly organised, and include iron manufactures, machinery, textiles, paper, glass-ware, leather and indiarubber goods, chemicals, wooden ware, toys, brewing, distilling, &c.

**Shipping and Railways.**—Principal ports are Bremen, Bremerhaven, Hamburg, Kiel, Stettin, and others, *q.v.* Merchant fleet in 1904, 4156 vessels of 2,322,045 tons, of which 1622 vessels of 1,739,690 tons were steamers. State railways in operation in 1905, 31,767 miles; private lines, 3175 m.; total, 34,942 m.

**Exports** (special, 1905), £279,272,000. **Imports,** £336,500,000.

**German South-West Africa.**—Area, 317,960 sq. m. Pop. 200,000; Europeans, 4682.

**Physical Features.**—Damaraland consists of mountains and wide grassy plains suitable for cattle-rearing. Namaland in the S. is mostly waterless desert, with bare table-mountains in the interior.

**Resources and Production.**—Cattle-rearing, sheep and goat farming, with a little agriculture and market-gardening, are the chief resources. Copper is worked, and other minerals found are gold, asbestos, graphite, diamonds, &c.

**Shipping and Railways.**—Chief port, Swakopmund. Railway line open, 236 miles.

**Exports:** cattle, hides, guano, and ostrich feathers (1903), £172,180. **Imports** (1903), £396,538.

**Ghent,** river-port of Belgium, at junction of the Lys and Scheldt. Lat. 51° 3′ N.; long. 3° 44′ E.; 34 miles by rail NW. of Brussels. Pop. (1900), 160,133. Distance from London, 163 m.; Hull, 253 m.

**Port Accommodation.**—Canal 19 m. to Terneuzen, with depth of 18 ft. at ordinary tides, admits vessels drawing not more than 17½ ft. all the year round; now being deepened to over 26 ft. Quayage of new dock (now nearly completed), 6560 ft.; depth, 21½ ft. Four other docks, with depths from 18¾ ft. to 20 ft. 11 in. Two dry docks, 446 and 255 ft. long.

**Steam Communication.**—Wilson line from Hull.

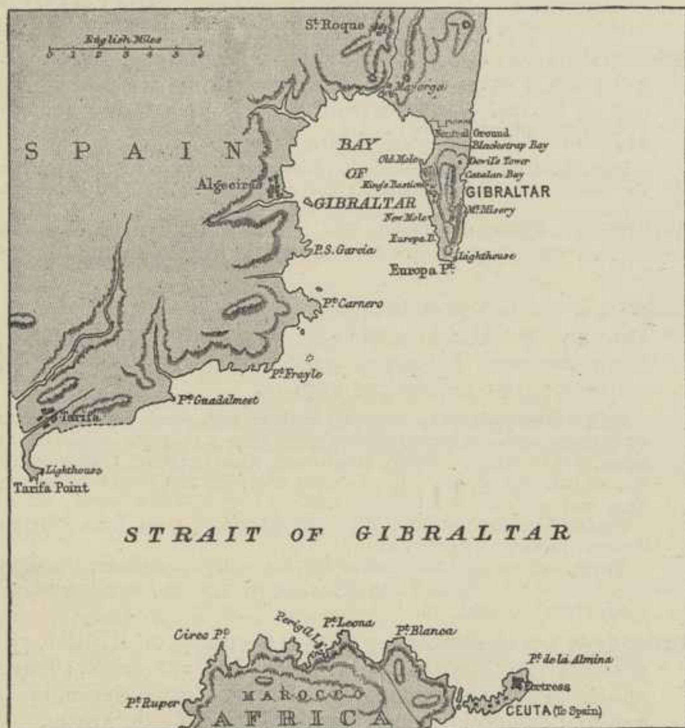
**Trade** (largely a transport one).—Exports: sugar, chicory, flax, fruit, hops, marble, whitelead, rags, shoddy, linen, butter, rape-oil, linseed cake, &c.; imports: coal, iron, copper, tin, machinery, salt, produce, and manufactured goods. B. V.-C.

**Gibraltar,** British fortress, port, naval base, and coaling station, in the extreme S. of Spain, at the entrance to the Mediterranean. Lat. 36° 6′ 30″ N.; long. 5° 21′ 12″ W. Distance from London, 1313 miles; Southampton, 1143 m.; Lisbon, 302 m.; Malta, 991 m.; Marseilles, 696 m.

**Port Accommodation.**—Good anchorage in bay for vessels of any size, in 3½ to 25 fathoms. Area of new enclosed harbour (nearing completion), 260 acres. Three Government dry docks (863, 563, and 463 ft.) under construction; also new dry dock (1250 ft.) for dredgers.

**Steam Communication.**—Hull, Orient, and P. & O. from London; Moss from Liverpool; Anchor from Glasgow, &c.

**Trade.**—Exports, in transit from Spain: wine, fruit, and cork; imports: textiles, hardware, petroleum, provisions, military and naval stores, &c.




**Gijon,** a port of N. Spain, on the Bay of Biscay. Lat. 43° 35′ N.; long. 5° 57′ W.; 20 miles by rail NNE. of Oviedo. Pop. (1900), 47,544. Distance from London, 688 m.; Liverpool, 675 m.; Bordeaux, 286 m.

**Port Accommodation.**—High water depths on bar at ordinary springs and neaps, 22 ft. and 18 ft.; quayage, 5532 ft.; high and low water depths alongside, 19 ft. 8 in. and 8 ft. 2 in. Graving dock, 288 ft. long.

**Trade.**—Exports: zinc, copper, manganese, blende, quicksilver, nuts, apples, cider, &c.; imports: iron, hardware, machinery, furniture, tar, coffee, oils, manures, &c. B. V.-C.

**Glasgow,** port and coaling station, in W. of Scotland, on the R. Clyde. Lat. 55° 52′ N.; long. 4° 16′ W.; 42½ miles W. of Edinburgh. Pop. (1901), 761,709.

**Port Accommodation.**—Water area of harbour and tidal docks, 206 acres; quayage, 44,040 ft., or 8½ miles. Depths at highest springs and lowest neaps (upper harbour), 24 ft. and 16 ft.; (lower harbour), 30 ft. and 22 ft.; (Kingston Dock), 28 ft. and 20 ft.; (Queen's Dock), 35 ft. and 27 ft.; (Prince's Dock), 37 ft. and 29 ft. Private docks are at Govan (Fairfield), 5½ acres, with 37 ft. and 24 ft. water; Clydebank, 5 acres, with 25 ft. at low water, besides 2700 ft. of wharfage for private firms along the Kelvin at Partick. Three public graving docks (570, 575, and 880 ft.), and two private graving docks and four patent slips.

**Trade.**—Exports (1905), £23,997,000; imports, £14,294,000.




**Gloucester,** port on the R. Severn, connected with the Bristol Channel by the Gloucester and Berkeley Canal.

**Port Accommodation.**—Commodious docks, with fully 2 miles of quayage available for vessels drawing 14 to 17 ft. At Sharpness at the other end of the canal, 16 miles distant, is the Sharpness Dock, with 4000 ft. of quayage and 24 ft. of water over the lock sill, and also a tidal basin; also a dry dock.

**Trade.**—Exports: salt, oil-seeds, metal ware (1905), £24,000; imports: grain, metals, seeds, timber, £3,370,000.

**Goa,** a Portuguese possession and port in W. of India. Lat. 15° 30′ N.; long. 73° 54′ E.

**Port Accommodation.**—Anchorage in 4 to 5 fathoms. Depth on river bar at low water, 13 ft.

**Trade.**—Exports: cocoa-nuts, grain, seeds, teak, &c. (1904), £105,258; imports: dry goods, kerosene, salt, railway materials, &c., £361,243. B. C. at Mormugão.

**Gold Coast.**—Area of colony and protectorate, 119,260 sq. m. Pop. (1901), 1,486,433.

**Physical Features.**—Coast land flat and swampy, with high surf; interior mostly tropical forest.

**Climate.**—Hot, damp, and unhealthy for Europeans.

**Resources and Production.**—The staple products are gold, palm-oil and kernels, rubber, kola-nuts, and timber. Plantations of cocoa, coffee, cotton, pepper, nutmeg, and pimento are being tried.

**Shipping and Railways.**—Principal ports, Accra, Sikondi, and Cape Coast Castle. Railway from Sikondi to Kumasi, 168 miles.

**Exports,** £1,455,500 (1905). **Imports,** £1,380,660.

**Gonaives,** a port on W. coast of Haiti. Lat. 19° 26′ N.; long. 72° 43′ W. Pop. 18,000.

**Port Accommodation.**—Fine harbour, with anchorage in 4 fathoms of water, 450 yards off shore.

**Steam Communication.**—Atlas line from New York.

**Trade.**—Exports: cotton, coffee, mahogany, lignum vitæ.

**Goole,** a port of Yorkshire at the junction of the Don with the Ouse. Lat. 53° 40′ N.; long. 0° 52′ W.; 23 miles above Hull. Pop. (1901), 16,576.

**Port Accommodation.**—Depth in locks at high water ordinary springs and neaps (Victoria), 25½ ft. and 22 ft.; (Ouse), 22 ft. and 18 ft.; (Ship), 17½ ft. and 14 ft.; (Barge), 21 ft. and 17 ft.; in the Ouse, Railway, Aldam, Ship, Barge, and No. 1 Branch docks, 22 ft. and 18 ft.; in harbour dock, 21 ft. and 17 ft. Dry dock and patent slip.

**Trade.**—Exports: coal, chemicals, textiles, cutlery, hardware, leather goods, machinery, &c. (1905), £8,517,000; imports: general merchandise, £7,926,000.

**Gothenburg (Göteborg),** a port of Sweden, on the Göta R., at its mouth in the Kattegat. Lat. 57° 42′ N.; long. 11° 57′ E.; 285 miles by rail SW. of Stockholm. Distance from London, 603 m.; Leith, 508 m.; Hull, 510 m.; Copenhagen, 130 m.

**Port Accommodation.**—Depth at entrance to harbour, 23 ft. Quayage, 15,187 ft.; with depths alongside varying from 7 to 19½ ft. Dry dock and six patent slips.

**Steam Communication.**—Thule line from London, Wilson line from Grimsby, and others.

**Trade.**—Exports are iron, steel, wood, wood-pulp, paper, matches, cattle, dairy produce, &c.; imports: coal, iron, machinery and implements, petroleum, grain, textile manufactures, &c. B. C.

**Grand Bassam,** a port on the Ivory Coast, French W. Africa, at mouth of the Como. Lat. 5° 11′ N.; long. 3° 43′ W.

**Port Accommodation.**—Open roadstead, with good anchorage in 7 to 9 fathoms. Private wharf, with depth of 31 to 33 ft. water at its head.

**Steam Communication.**—Woermann line from Hamburg.

**Trade.**—Exports: gold dust, ivory, palm-oil. B. V.-C.

**Grand Canary.** *See* **Las Palmas.**

**Grand Popo,** a port of Dahomey, French Guinea. Lat. 6° 17′ N.; long. 1° 52′ E.; 15 miles W. of Whydah.

**Port Accommodation.**—Anchorage in 7 fathoms to the W. of the town.

**Steam Communication.**—Woermann line from Hamburg.

**Grangemouth,** port of Scotland, on the Forth. Lat. 56° 6′ N.; long. 3° 49′ W. Distance from Leith, 19½ m.; from London, 435 m.

**Port Accommodation.**—Water area of docks, 130 acres. Depth on sills at spring tides, 17 to 32 ft. Dry dock, 273 ft. long.

**Trade.**—Exports: coal, machinery, cotton goods, metals, &c. (1905), £2,164,303; imports: iron, wood, sugar, woollen goods, margarine, &c., £4,109,104.

**Great Britain.** *See* **United Kingdom.**

**Greece.**—Area, 24,973 sq. m. Pop. (1896), 2,433.806.

**Physical Features.**—The mainland consists of two parts connected by the Isthmus of Corinth; surface mountainous, with the plain of Thessaly in the N., and the rough plateau of Arcadia in the S.; rivers mere mountain torrents, mostly dry in summer; coast line bold and much indented.

**Climate.**—Mild and equable on coasts and islands, but subject to extremes of heat and cold in mountain valleys (113° to 10.4° F. have been noted). Mean annual temperature at Athens, 65.3° F. (Jan. 46.4°, July, 80.6°); at Corfu, 64.5° F. Moderate rainfall between October and March.

**Resources and Production.**—Mainly agricultural; cultivated area about 5,563,100 acres, of which 1,112,000 acres are under cereals, 1,200,000 fallow, and 2,025,400 forest land; in addition there are some 5,000,000 acres under pasture, and 3,000,000 acres of waste land. Besides wheat, rye, maize, and mezlin, the best cultivated crop is that of currants, of which there is an annual yield of 150,000 tons; the crop of valonia was (1904) 9000 tons; tobacco and sugar are also cultivated; annual value of silk and cocoons exported, £57,000. The chief minerals worked are iron, zinc, arsenic, silver-lead, marble, chrome ore, &c. Sponges are got off the coasts.

**Shipping and Railways.**—Chief ports, Piræus, Corfu, Kalamata, and Volo. Merchant fleet (1904), 206 steamers of 198,681 tons, and 1035 sailing vessels of 145,118 tons. Vessels entered (1904), 7190 of 4,793,200 tons; cleared 6903 of 4,934,441 tons. Railways open, 700 miles.

**Exports** (1904), £3,653,066; to U.K., about 26 per cent. **Imports,** £5,509,299; from U.K., about 22 per cent.

**Greenock,** port on the Firth of Clyde, Scotland. Lat. 55° 57′ N.; long. 4° 44′ W.; 22 miles W. of Glasgow.

**Port Accommodation.**—Water area of docks, 45 acres; quayage, 21,182 ft. Depth of water on sills at high water springs and neaps, down to 30 and 32 ft. (James Watt Dock). Three graving docks, 2 private dry docks, and 2 private slips. Three private slips at Gourock; quayage at Gourock, 1000 ft.

**Trade.**—Exports: refined sugar, coal, iron, linen and jute goods (1905), £793,889; imports: raw sugar, timber, grain, cotton, &c., £1,257,568.

**Grenada,** a British W. I. island, with port and imperial coaling station (St. George), in the Windward group. Lat. 12° 2′ N.; long. 61° 48′ W. Pop. (1901), 65,523. Distance from London, 3960 m.; Liverpool, 3737 m.; Port of Spain, 101 m.

**Port Accommodation.**—Good anchorage in 50 to 60 ft. of water. Loading and discharging by lighters. Wharf, 200 ft. long, accessible only to vessels drawing 8 ft. Private jetty 130 ft. long, belonging to R.S.M.P. Co.

**Steam Communication.**—R.S.M.P. from Southampton.

**Trade.**—Exports are rum, molasses, sugar, cacao, coffee, cotton, and fruit (1905), £283,955; to U.K., £181,970. Imports, general merchandise, £237,256; from U. K., £100,082.

**Greytown (San Juan del Norte),** a port of Nicaragua, on the Caribbean Sea. Lat. 10° 55′ N.; long. 83° 47′ W. Pop. 2000. Distance from Liverpool, 4753 m.; New York, 2033 m.; Cartagina, 481 m.

**Port Accommodation.**—Depth on bar, 7 to 11½ ft. Anchorage in open roadstead. Loading and discharging by lighters.

**Steam Communication.**—Atlas line from New York.

**Trade.**—Exports are mahogany, rubber, bananas, hides, indigo, gold; imports: general merchandise. B. C.

**Grimsby,** port and coaling station, Lincolnshire, on the Humber. Lat. 53° 32′ N.; long. 0° 5′ W., 14 m. SE. of Hull. Pop. (1901), 63,138. Distance by sea from London, 221 m.

**Port Accommodation.**—Water area of docks, 103¼ acres; quayage, 20,209 ft. Depth over sill at high water of spring and neap tides, and highest springs (Alexandra Dock), 18, 14, and 19½ ft.; (Royal dock), 26, 22, and 27½ ft.; (Union Dock), 21½, 18, and 23 ft.; (Fish docks), 20, 16, and 22 ft. Three dry docks, 2 patent slips, and a pontoon.

**Trade.**—Exports: cottons, woollens, yarns, and worsted goods, coal, machinery, leather, fish, &c. (1905), £11,504,000; imports: wools and woollens, embroidery, needlework, cottons, ironware, leather goods, beef, bacon, toys, dairy produce, &c. (£10,687,000).

**Guadeloupe,** a French possession in the Lesser Antilles, W. Indies, between lat. 15° 57′ and 16° 31′ N., and long. 61° and 62° W. Area, with its dependencies (Marie-Galante, La Désirade, Les Saintes, Petite-Terre, St. Barthélemy, and the N. part of St. Martin), 688 sq. m. Pop. (1901), 182,112.

**Physical Features.**—The R. Salie almost divides the colony into two islands; the E. of which (Grande-Terre) is low and of coral formation; the W. (Basse-Terre) is of volcanic origin and mountainous, culminating in La Soufrière (4870 ft.). Well watered and fertile. Climate not unhealthy in general; mean annual temperature, 78° 8′ Fahr. The capital is Basse-Terre (9500 inh.), but Pointe-à-Pitre (20,000 inh.), with a safe harbour accessible to the largest vessels is the commercial centre. R.M.S.P. from Southampton; C.G.T.N. from St. Nazaire, &c.

**Resources and Production.**—The chief crops grown are sugar-cane, coffee, and cocoa; others are bananas, manioc, sweet potatoes, tobacco, Indian corn, and vegetables; the mountain forests cover 175,574 acres, and yield valuable timber.

**Exports** (1905), £625,480. **Imports,** £537,520.

**Guatemala.**—Area, 43,640 sq. m. Pop. 1,842,000.

**Physical Features.**—The greater part is mountainous, showing great variety of plateaus and upland valleys, noted for their beauty, fertility, and salubrious climate. In the W. the mountains slope abruptly to the narrow coastal belt, which is swampy and unhealthy; on this side, too, are the volcanoes, some of them still active. The country is well watered, but there is no navigable river of importance. Much dense forest.

**Climate** varies with altitude. Temperature on coast, 74° 72′ to 85° 1′ Faht.; at 3000 ft., 62° 95′ to 73° 4′; at 4900 ft., 60° 8′ to 67° 55′. Rainfall abundant, but most copious on Atlantic slopes; thunderstorms frequent from May to September.

**Resources and Production.**—Coffee (largely in the hands of Germans) is the most important crop; nearly 639,800 cwts. were exported in 1904; other crops are tobacco, sugar, cocoa, and bananas (425,153 bunches exported in 1904). Minerals are but little worked.

**Shipping and Railways.**—The chief port is Puerto Barrios, *q.v.* Vessels entered (1904), 507. Total length of railway open, 400 miles.

**Exports** (1904), £1,510,373; to Gt. Britain (1903), £297,797. **Imports,** £1,008,228; from Gt. Britain, £207,666.

**Guayaquil,** port and coaling station, Ecuador, on Gulf of Guayaquil. Lat. 2° 12′ S.; long. 79° 43′ W. Distance from London, 10,662 m.; Honolulu, 4834 m.; Panama, 835 m.

**Port Accommodation.**—Vessels of 25 ft. draught can reach city. Depth on bar, 10 to 26 ft.

**Steam Communication.**—P.S.N. from Panama.

**Trade.**—Exports: cocoa, coffee, cinchona, rice, hides, straw hats, cottons, tobacco, rubber, and timber; imports: provisions, furnishings, and general goods. B. C.

**Guernsey,** Channel Isles.

**Port Accommodation.**—Tidal harbour at St. Peter Port of 70 acres, with depth at ordinary neaps of 6 to 32 ft. Floating dock. Smaller harbour at St. Sampson.

**Steam Communication** with Southampton and Weymouth.

**Exports**: vegetables, fruit and cattle.

**Haifa,** a port of Syria, at the foot of Mt. Carmel. Lat. 32° 48′ N.; long. 35° 0′ E. Pop. (1900), 12,000. Distance from Port Said, 172 m.

**Port Accommodation.**—Open roadstead, with good anchorage in 6 fathoms of water. Harbour has 20 ft. water.

**Trade.**—Exports: wheat and sesame, £89,600; imports: general merchandise, £119,000. B. V.-C.

**Haiphong,** a port of Tongking, Indo-China, on Red River delta. Lat. 20° 53′ N.; long. 106° 40′ E. Pop. 17,000. Distance from Turan, 307 m. by water.

**Port Accommodation.**—Two bars with 11 and 9 ft. at low water of ordinary spring tides. Rise of tide, 10 ft. Depth inside port, 24 ft. at high water. Floating pontoon, 540 ft. long for mail steamers. Loading and discharging by lighters. Patent slip, 450 ft. long.

**Trade.**—Exports: rice.

**Haiti,** a republic occupying the western portion of the island of San Domingo, West Indies. Area, 11,100 sq. m. Pop. 1,425,000.

**Physical Features.**—The coast is much indented, with two long mountainous peninsulas in the W., and the richly-wooded island of Gonaive in the intervening gulf. The surface in general consists of mountain, plain, and valley. The rivers are short, and useful only for irrigation.

**Climate.**—Temperature on the hills rarely exceeds 75° F., and sometimes falls to zero; in the valleys it has risen to 98° 6′. Two dry and two wet seasons with copious rainfall.

**Resources and Production.**—The chief agricultural product is coffee, of which 38,853,718 lbs. were exported in 1905, a bad year; other products exported were cocoa, 4,924,383 lbs.; cotton, 3,287,669 lbs.; logwood, 78,141,728 lbs.; guaiacum, &c. There are heavy export duties.

**Shipping and Railways.**—Principal ports are Aux Cayes, Port-au-Prince, and Jacmel, *q.v.* Vessels entered and cleared (1902), 832 of 1,089,983 tons. Length of railways open, 53 miles. No complete trade returns.

**Hakodate,** a port and coaling station in S. of Yezo, Japan. Lat. 41° 47′ N.; long. 140° 46′ E., 802 m. from Kagasaki. Pop. (1901), 89,454. Distance from London, 11,516 m.; Shanghai, 1176 m.; Vladivostok, 424 m.

**Port Accommodation.**—Good roadstead with anchorage in 5½ fathoms. Dry dock, 531 ft. long, suitable for vessels under 26 ft. draft. Patent slipway.

**Trade.**—Exports: seaweed, rice, dried fish, salt, straw ropes, bags, sulphur, &c. (1905), £231,653; imports: textiles, sugar, &c., £91,085. B. C.

**Halifax,** a fortified port, naval and coaling station, Nova Scotia. Lat. 44° 40′ N.; long. 63° 35′ W. Pop. (1901), 40,832. Distance from Liverpool, 2485 m.; New York, 599 m.; Quebec, 737 m.; Gibraltar, 2671 m.

**Port Accommodation.**—Spacious harbour with good anchorage in 12 to 15 fathoms water. Quayage (Terminus), 3700 ft.; depths at high and low water, 31½ to 35 ft.; quayage (Richmond wharf), 2300 ft.; depth 20 to 30 ft.; rise and fall of tide, 6 ft. Graving dock, 600 feet long. Three patent slips, and a patent bow and stern dock.

**Steam Communication.**—Allan and Dominion lines from Liverpool; Furness line from London, &c.

**Trade.**—Exports: coal, timber, fish, cattle, flour, potatoes, butter, furs, oils, apples, &c. (1904) £1,840,650; imports: general merchandise of all kinds (1904), £1,693,212.

**Hamburg,** a port and coaling station, Germany, on R. Elbe, 75 m. from its mouth in the North Sea. Lat. 58° 32′ N.; long. 9° 58′ E. Pop. (1903), 743,060. Distance from Berlin, by rail, 178 m.; London, 436 m.; Hull, 387 m.; Leith, 491 m.

**Port Accommodation.**—Tidal docks accessible at high water of ordinary springs to vessels drawing 32 ft. Depths in the docks vary from 22.9 ft. at high and 16.4 ft. at low water, to 31¼ ft. and 25¾ ft. at high and low water. Large improvement works in progress. Three iron, 3 steel, and 1 wooden floating docks, a graving dock, and 6 patent slips.

**Steam Communication.**—Wilson line from Hull, Currie's line from Leith, Hamburg-American, &c.

**Trade.**—Exports (1905), £140,450,000; imports, £114,931,000. B. C.

**Hamilton.** *See* **Bermudas.**

**Hankow,** a treaty port of China, at the confluence of the Han-kiang and Yang-tse-kiang, 700 m. from its mouth. Lat. 30° 50′ N.; long. 114° 0′ E. Distance from London, 11,008 m.

**Port Accommodation.**—Inaccessible port in winter for vessels over 12 ft. draught; after April vessels drawing 24 ft. can enter. Greatest depth in August, 40 to 45 ft., gradually declining to 8 or 9 ft. in February.

**Trade.**—Exports: tea, oil, cotton, tallow, hides, rhea fibre, hemp, bristles, medicines, &c. (1905), £8,604,637; imports: piece goods, opium, lead, quicksilver, sugar, tin-plates, coal, &c., £7,146,444. B. C.

**Harburg,** a port of Germany, on the Elbe. Lat. 53° 27′ N.; long. 9° 59′ E.; 7 m. by rail S. of Hamburg.

**Port Accommodation.**—Channel being dredged out so as to admit the largest vessels. Three new harbours with a depth of 24 ft. at high water are under construction, and will be completed in 1907. Quayage, 12,600 ft., with high and low water depths alongside varying from 8 and 3 ft. (Kauffahrtskanal) to 19 and 14 ft. (Neue-Quai and Wiesenkanal). Slipway, 150 ft. long.

**Trade,** largely a distributive one. Exports: manures, oil-cake, oils, indiarubber, chemicals, cement, &c.; imports: coal, tar, iron, bricks, slates, paraffin, phosphates, china clay, herrings, &c. B. V.-C.

**Harfleur.** *See* **Havre.**

**Hartlepool** and **West Hartlepool,** a port and coaling station of Durham, N. of the mouth of the Tees. Lat. 54° 41′ N.; long. 1° 11′ W.; 31 m. by water from Newcastle. Pop. (1901), 86,310.

**Port Accommodation.**—High water depths at entrance, at ordinary springs and neaps, 26 ft. and 22 ft.; quayage (Victoria Dock), 5320 ft.; depths at ordinary springs and neaps, 21½ ft. and 17½ ft. Quayage of W. Hartlepool docks, 18,456 ft.; depths at high water springs and neaps (Central and Union docks), 26 ft. and 22 ft.; (S. Basin, Timber or Jackson docks), 21½ ft. and 17½ ft.; (Swainson dock), 22½ ft. and 18½ ft.; (Coal dock), 25 ft. and 21 ft. Four graving docks (380, 344, 386, 380 ft.), dry dock and gridiron (577 ft.), and gridiron.

**Trade.**—Exports: coal, machinery, iron and steel wares, textiles, &c. (1905), £859,000; imports: iron ore, timber, grain, sugar, dairy produce, and general merchandise, £1,508,000.

**Harwich,** a port and naval station, Essex, on estuary of R. Stour. Lat. 51° 56′ N.; long. 1° 17′ E.; 71 m. by rail NE. of London. Pop. (1901), 10,019. Distance from Hook of Holland, 106 m.

**Port Accommodation.**—Harbour channel dredged to 20 ft. at low water springs. Depth at high and low water, 32 ft. and 19½ ft.; alongside quay at high water, 10 ft. Quayage at Felixstowe, 600 ft.; depth being dredged to 23 ft. Patent slip.

**Steam Communication.**—Steamers to Hook of Holland, Rotterdam, Antwerp, Hamburg, Esbjerg, &c.

**Trade,** chiefly general merchandise in transit; exports (1905): £4,786,000; imports: £18,198,000.

**Havana,** port and coaling station in N. of Cuba. Lat. 23° 8′ N.; long. 82° 23′ W. Pop. (1899), 242,055. Distance from London, 4258 m.; Key West, 93 m.; New Orleans, 585 m.; Vera Cruz, 809 m.

**Port Accommodation.**—Spacious harbour with good anchorage for largest vessels. Depth up to 32 ft. at quayside, at high water of ordinary springs; rise and fall of ordinary tides, 2 ft.; springs, 3½ ft. Ample quayage, and several coal-yards. Longitudinal slip; floating dry-dock, 360 ft. long; and marine railway.

**Steam Communication.**—Ward line from New York.

**Trade.**—Exports are tobacco, cigars, sugar, molasses, beeswax, honey, &c.; imports: provisions, cottons, silks, timber, &c. B. C.

**Havre,** fortified port and coaling station, France, on N. side of the Seine estuary. Lat. 49° 29′ N.; long. 0° 6′ E.; 142 m. by rail NW. of Paris. Pop. (1901), 130,196. Distance from Southampton, 105 m.; Leith, 488 m.; Cherbourg, 71 m.

**Port Accommodation.**—New outer harbour, 30 ft. deep at low water, now nearly completed. Quayage of tidal harbour, 5118 ft.; high and low water depths, ordinary springs and neaps, 32.2 and 25.9 ft.; and 6.5 and 13 ft. Quayage of docks, 38,144 ft., with depths over sill at ordinary springs, from 20.4 ft. to 35.4 ft. Tancarville Canal available as far as Harfleur for vessels of 19 ft. draught and 45 ft. beam, has a depth of 20 ft.; 6 dry docks (224, 238, 290, 656, 560, 425 ft.).

**Steam Communication.**—S. W. Railway from Southampton, C.G.T.N., &c.

**Trade.**—Exports are wines, millinery, textiles, furniture, oils, dyes, drugs, potatoes, sardines, &c., &c.; imports are coal, cotton, coffee, grain, dye-woods, hides, sugar, petroleum, &c. Value of trade (1904), £74,760,000.

**Hawaii** (formerly called the Sandwich Islands).—A chain of islands in the North Pacific which extends from WNW. to ESE. for 340 miles. The chief islands are Hawaii, Mani, Molokai, Oahu, and Kanai. Sugar is the staple product, but coffee, rice, hides, bananas, &c., are also exported. The trade is chiefly with the United States, which annexed the islands in 1898. Area, 6449 sq. m. Pop. 154,000. Capital and chief port, Honolulu (*q.v.*).

**Exports** (1905), £5,140,000. **Imports,** £3,012,000.

**Hayti.** *See* **Aux Cayes, Jacmel, San Domingo, &c.**

**Helsingborg,** a port and coaling station in S. Sweden, on the Sound. Lat. 56° 4′ N.; long. 12° 49′ E. Pop. (1900), 24,670. Distance from Hull, 610 m.

**Port Accommodation.**—Depth at entrance, 24 ft.; at quayside (new harbour), 23 ft.; (old harbour), 19 ft. Quayage, 8600 ft. No tides.

**Steam Communication.**—Wilson line from Hull.

**Trade.**—Exports: cattle, dairy produce, bricks, timber, wood-pulp, wheat, &c.; imports: coal, iron, manures, produce, sugar, saltpetre, coffee, salt, and grain. B. V.-C.

**Helsingfors,** a port of Finland on the Gulf of Finland. Lat. 60° 10′ N.; long. 24° 58′ E. Distance by sea from St. Petersburg, 168 m.; from London, 1226 m.; from Hull, 1156 m.; from Copenhagen, 533 m.

**Port Accommodation.**—Good anchorage; depth at entrance over 60 ft. Quayage, 9680 ft.; depths alongside (S. harbour), 17 to 28 ft.; (N. harbour), 15 to 22 ft.; (W. harbour), 15 to 23 ft. Dry dock, 314 ft. long, and 6 patent slipways.

**Steam Communication.**—Finland lines from Hull.

**Trade.**—Exports: timber, butter, wood-pulp, paper, &c. (1904), £340,744; imports: coal, iron, steel, machinery, corn, textiles, oil, coffee, wines, and spirits, £635,015. B. C.

**Hernösand,** a port of Sweden, on Gulf of Bothnia. Lat. 62° 36′ N.; long. 17° 20′ E. Distance from London, 1300 m.; from Stockholm, 225 m.; from Copenhagen, 586 m.

**Port Accommodation.**—Spacious harbour with good anchorage in 40 to 60 ft. water. Quayage, 5500 ft.; depth alongside, 13 to 17 ft.; depth of inner harbour, 15 to 25 ft. Private piers at Bollsta, Kramfors, and Nyland, with depths from 12 to 23 ft. alongside. Patent slip.

**Trade.**—Exports: timber, wood-pulp, and cellulose; imports: coal, salt, produce, wine, spirits, live stock, &c. B. V.-C.

**Hiogo (Kobé),** port and coaling station on S. coast of Hondo I., Japan. Lat. 34° 40′ N.; long. 135° 14′ E. Pop. (1898) with Kobé, 215,780. Distance from London, 10,889 m.; from Hong-Kong, 1372 m.; from Yokohama, 350 m.

**Port Accommodation.**—Good anchorage in depths from 20 to 40 ft. Depths 400 ft. from end of Ohno pier, at high and low water, 24 ft. and 18 ft. Loading and discharging by lighters. Dry dock, 407 ft. long and two patent slips.

**Steam Communication.**—Ben and Shire lines from London; N.Y.K. from Southampton; Messageries from Marseilles, and others.

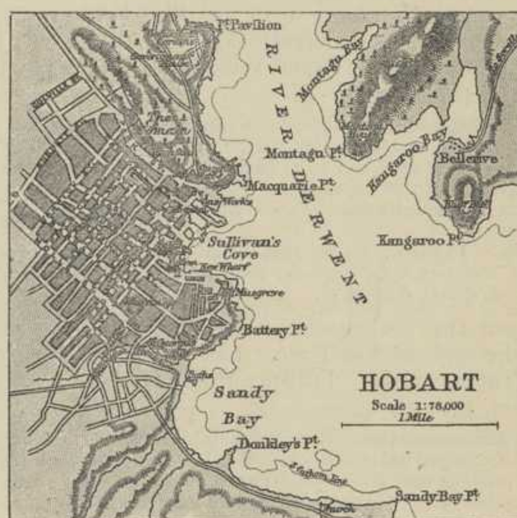
**Trade.**—Exports: cotton yarn, textiles, tea, copper, antimony, hemp, flax, straw-plait, rice, jute, carpets, &c. (1904), £8,981,000; imports: raw cotton, iron, steel, and tin manufactures, coals, wines, salt, textiles, chemicals, medicines, &c., £17,850,000. B. C.

**Hobart,** port and coaling station, Tasmania, on R. Derwent, 12 m. from its mouth. Lat. 42° 53′ S.; long. 147° 21′ E., 133 m. by rail S. of Launceston. Pop. with suburbs (1901), 34,182. Distance from London *viâ* Suez, 11,380 m.; from Melbourne, 443 m.; from Sydney, 628 m.; from Auckland, 1520 m.

**Port Accommodation.**—Good anchorage in harbour close up to wharves in about 7 fathoms water. Quayage and wharfage, 5134 ft., besides about 2000 ft. of piers. Three patent slips, 580, 940, and 300 ft. long respectively.

**Steam Communication.**—N.Z. Co. and Shaw, Savill from London, U.S. Co. of N.Z. from Melbourne, Sydney, &c.

**Trade.**—Exports: wool, grain, timber, hops, vegetables, fruits, oil, tin, &c.; imports: manufactured goods of all kinds, and general merchandise. Total value of trade: £1,861,000.




**Hodeida,** a port of El Yemen, Arabia, on the Red Sea. Lat. 14° 49′ N.; long. 42° 55′ E. Distance from London, 4410 m.; from Suakin, 426 m.; from Aden, 232 m.

**Port Accommodation.**—Anchorage, 5½ m. off shore.

**Trade.**—Exports: coffee, jowari, sesame, senna, and skins (1904), £450,665; imports: grain, cotton goods, and petroleum, £467,095. B. V.-C.

**Holland.** *See* **Netherlands.**

**Holtenau,** a port of Germany, on Kiel Bay, at the Baltic end of the Kaiser Wilhelm Canal. Lat. 54° 23′ N.; long. 10° 5′ E.

**Port Accommodation.**—Length of harbour, 2625 ft.; width, 656 ft.

**Honduras,** a republic of Central America. Area, 42,270 sq. m. Pop. 543,800.

**Physical Features.**—The coasts are flat and swampy; the interior a vast plateau dominated by several mountain chains, especially in the N. and S., and interspersed with fertile valleys. The principal rivers all flow to the Atlantic, and none is navigable for vessels of any draught. Much of the surface is forest land.

**Climate** varies with the relief of the country; the Pacific slopes are hot and dry; those of the Atlantic humid and less healthy; while the plateau region is healthy, with temperature from 55.4° to 68° Faht., and a copious but not torrential rainfall.

**Resources and Production.**—The agricultural products are bananas (42,840 acres), tobacco, sugar, maize, cocoanuts, oranges, lemons, sarsaparilla, beans, indigo, rice, and wheat. From the forests much valuable timber is obtained. Gold, silver, platinum, copper, lead, zinc, iron, antimony, nickel, and coal are found; 23,235 oz. of gold, and 1,010,204 oz. of silver were exported in 1902.

**Shipping and Railways.**—Principal ports, Ampala, Puerto Cortas, and Trujillo. Merchant fleet, 3 steamers of 1185 tons, and 2 sailing ships of 199 tons. Vessels entered (1904), 2850 of 571,721 tons; cleared, 2849 of 571,647 tons.

**Exports** (1904–5), £494,578; to U.K., £7,602. **Imports,** £472,552; from U.K., £42,552.

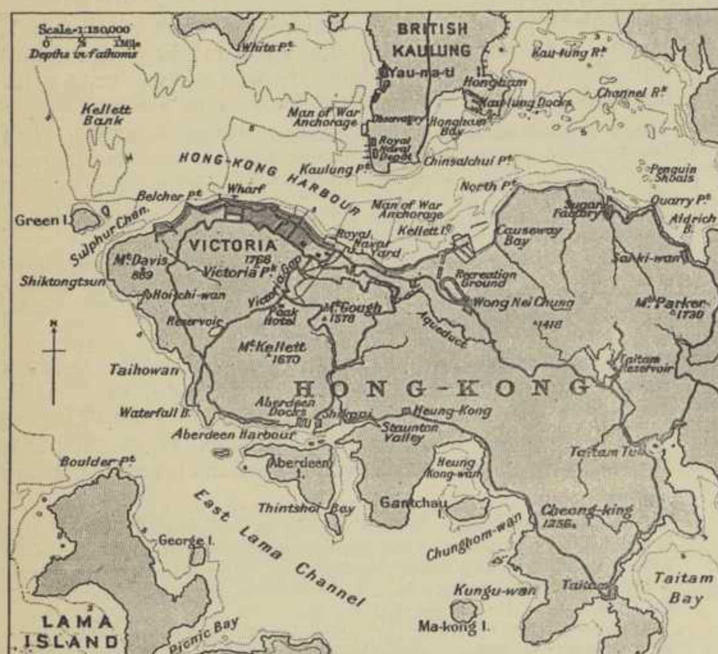
**Hong-Kong,** an island belonging to Britain, port, naval and coaling station in China. Lat. 22° 17′ N.; long. 114° 11′ E. Pop. (1901), 283,905. Distance from London, 9900 m.; from Shanghai, 853 m.; from Yokohama, 1580 m.

**Port Accommodation.**—Depth of water for largest vessels. Quayage (West Point and Kowloon wharves), 3900 ft.; depths alongside at high and low water, 32 and 28 ft. In addition there are wharves belonging to private companies. Seven dry docks (430, 334, 573, 394, 468, 700, and 265 ft. long), and five patent slips.

**Steam Communication.**—P. and O.; Ben and Glen lines from London; Nippon Yusen from Southampton; Messageries from Marseilles; Florio Rubattino from Genoa, &c.; C.P.R. from Vancouver.

**Trade.**—Chiefly transit. Exports: silk, tea, rice, camphor, &c.; imports:

coal, opium, hardware, and general goods. Total value of Trade (1904), about £82,000,000.




**Honolulu,** port and coaling station on S. coast of Oahu, Hawaii. Lat. 21° 18′ N.; long. 157° 52′ W. Pop. (1900), 39,305. Distance from London (*viâ* Magellan), 13,801 m.; from San Francisco, 2098 m.; from Victoria (B. C.), 2339 m.; from Sydney, 4417 m.

**Port Accommodation.**—Depths at entrance at high and low water ordinary springs, 32 and 30 ft.; in port, 23 to 29 ft., and 21 to 27 ft.; alongside quays, 17 to 28 ft. and 15 to 26 ft. Quayage, 7000 ft. Marine railway to take vessels of 1300 tons.
**Steam Communication.**—Pacific Mail from San Francisco, and other lines.
**Trade.**—Exports: sugar, rice, hides, tallow, wool, coffee, bananas, oranges, molasses, &c.; imports: coal, metals, machinery, textiles, timber, provisions, spirits, &c. B. C.

**Huelva,** port and coaling station in S. of Spain, near junction of the Odiel and the Rio Tinto. Lat. 37° 18′ N.; long. 6° 52′ W. Pop. (1900), 21,359. Distance from Liverpool, 1204 m.; from Glasgow, 1302 m.

**Port Accommodation.**—Estuary accessible to vessels drawing 21 to 24 ft. water. Quayage (inside and out); depths alongside at high and low water (Town pier), 34 and 22 ft.; (Rio Tinto), 26 and 15½ ft.; (Zafra and H.R. Co.), 14 and 3 ft.; (Tharsis), 26 and 16 ft.; (Newtown), minimum depth, 28 ft.
**Steam Communication.**—Hall line from London.
**Trade.** Exports: copper and pyrites, wine, cork, &c.; imports: coal, coke, iron, steel, machinery, &c. B. V.-C.

**Hull,** port and coaling station, Yorkshire, on N. side of the Humber, 20 m. from the sea. Lat. 53° 44′ N.; long. 0° 20′ W. Pop. (1901), 240,618. Distance by sea from London, 238 m.; from Newcastle, 139 m.; from Boston, 70 m.

**Port Accommodation.**—Water area about 193 acres. Quayage about 9 m. Numerous tidal docks and basins with depths varying from 14½ ft. at lowest neaps to 34 ft. at high water ordinary springs. High and low water depth at entrance to old harbour, 27 ft. and 5 ft. Eight dry docks, a graving dock, and nine patent slips.
**Steam Communication.**—Regular sailings to London and the Continent.
**Trade.**—Exports: coal, coke, textiles, chemicals, machinery, oil, seed, &c. (1905), £21,002,686; imports: grain, provisions, cattle, timber, iron, guano, flax, hemp, olive oil, and general goods, £32,545,886.




**Iceland.**—Area, 40,420 sq. m.; inhabited area, 16,300 sq. m. Pop. 78,500.

**Physical Features.**—Coast, except on S., much indented by fjords and bays; interior a vast treeless tableland from 1600 to 3000 ft. high, consisting of sand and lava deserts, above which rise small ice-covered plateaus; numerous volcanoes and hot springs; habitable parts only along coast and in river valleys, where there is pasture land; several lakes; highest peak Oraefajökull, 6430 ft.
**Climate.**—Mean annual temperature at Reykjavik 39.3° F. Extreme of heat 60.25°; of cold, 2.75° F.
**Resources and Production.**—The only crop is hay, used as fodder for cattle, sheep, and ponies. Valuable fisheries around coast, the chief trade being in fish and fish products; ponies are also exported. Trade chiefly with Denmark.
**Shipping.**—Chief port, Reykjavik. Over 40 per cent. of shipping British.
**Exports** (1904), £189,800. **Imports,** £137,000.

**Independencia (Fray Bentos),** a port of Uruguay, on R. Uruguay. Lat. 33° 15′ S.; 58° 10′ W., 170 m. NW. of Montevideo. Pop. 6000.

**Port Accommodation.**—Depth on bar, 16 to 17 ft.
**Trade.**—Exports: meat extracts.

**India.**—Area, with native states and dependencies, 1,766,600 sq. m. Pop. 295,361,000.

**Physical Features.**—The surface comprises three distinct regions—that of the Himalayas; that of the plains, watered by the Indus, Sutlej, Ganges, Brahmaputra, and their tributaries; and that of the great triangular plateau in the S., bounded by the Vindhya Mts., and the E. and W. Ghats, and watered by the Godaveri, Kistna, Cauvery, and other large rivers. Burma is mountain, valley, and plain, watered by the Irrawadi, Salwin, &c.
**Climate.**—Varies with latitude and altitude; hot in the plains; generally healthy. Rainfall varies from 8 in. in Sind to 600 in. in the hills of Assam.
**Resources and Production.**—Agriculture is the staple industry. The production of wheat in 1905–6 was 8,560,340 tons, and of rice in 1904–5, 21,805,740 tons, and a large acreage is under millet of various kinds, maize, barley, &c. Fully 1875 thousand tons of raw sugar were produced in 1904–5, 222 million lbs. of tea, 31 million lbs. of coffee, and nearly 30 million cwt. of jute (1905–6), and 11½ million of cotton. Forests cover an area of 104,900 sq. miles. Among minerals worked are coal, iron, gold, rubies, and petroleum. The coal output in 1904–5 was 8,425,431 tons. India possesses numerous cotton and jute mills, as well as several woollen and paper mills; there are also breweries.
**Shipping and Railways.**—Vessels entered (1904–5), 4991, of 7,030,955 tons; cleared, 4807 vessels of 6,850,381 tons.
Length of railways open (April 1906), 28,684 miles.
**Exports** (1905), £108,219,000. **Imports,** £83,083,000.

**Inhambane,** a port of Portuguese E. Africa. Lat. 23° 50′ S.; long. 35° 25′ E. Pop. 3300. Distance from London *viâ* Suez, 7350 m.

**Port Accommodation.**—Bar, 4 m. off shore, with depth of 213 ft. at high water spring tides. Good anchorage in bay.
**Steam Communication.**—D.O.A.L. from Hamburg.
**Trade.**—Exports: indiarubber, wax, ivory, copal, oil-nuts, £30,000; imports: £79,400.

**Iquique,** a port of Chile, prov. Tarapaca. Lat. 20° 13′ S.; long. 70° 14′ W. Pop. (1901), 42,498. Distance from London (*viâ* Magellan). 9575 m.; from Valparaiso, 793 m.; from Newcastle (N.S.W.), 7000 m.

**Port Accommodation.**—Anchorage in 11 fathoms water, about 2 m. off shore. Loading and discharging by lighters.
**Steam Communication.**—Kosmos line from London; Cia. Sud-Americana from Valparaiso.
**Trade.**—Exports: nitrate of soda, borax, copper and silver ores, £5,490,000; imports: coal, iron, machinery, sacking, earthenware, &c., £1,100,000. B. C.

**Iquitos,** a river port of Peru, on the Mayali. Lat. 3° 47′ S.; long. 73° 19′ W. Pop. 12,000. Exports: rubber.

**Steam Communication.**—Iquitos Steamship Company from Liverpool.
**Trade.**—Exports: chiefly rubber, £557,000 (1905); imports: £1,000,000.

**Italy.**—Area, 110,690 sq. m. Pop. (1905), 33,477,700.

**Physical Features.**—Surface mountainous; bounded by the Alps in the N.; intersected from N. to S. by the Apennines, which are continued into Sicily; traversed by several plains, the chief of which is that formed by the basin of the Po.
**Climate.**—Mean annual temperature and rainfall at Rome, 59.7° F. and 30.6 in.; at Naples, 61.1° F. and 32.4 in.; Syracuse, 64.8° F. and 21.1 in.; Genoa, 60° F. and 51.3 in.; Udine, 55.4° F. and 60.5 in.
**Resources and Production.**—70.6 per cent. of the soil is productive, but agriculture is generally in a primitive condition. About 19,550,000 quarters of wheat were grown in 1905. Another large crop is maize, of which over 10 million quarters were grown. The olives yield about 70 million gallons of oil, and the vineyards 770 million gallons of wine. Exclusive of chestnut plantations, about 10,110.000 acres are under forests, yielding products to the value of £3,500,000 annually. Italy has a large trade in cereals, fibres, fruit, cocoons (silk), tobacco, wool, milk, &c. The country is rich in minerals, the most valuable of those mined in 1905 being sulphur (3⅞ million tons), zinc (146,000 tons), iron (361,000 tons), copper (147,000 tons), and mineral fuel (406,000 tons). The quarries yielded stone, &c., to the value of £1,800,200. Coral, sponge, and tunny fishing is actively engaged in off the coasts, the value of the fisheries in 1903 being estimated at fully £735,000.
**Shipping and Railways.**—Chief ports: Ancona, Genoa, Leghorn, Naples, Venice, and others. Merchant fleet (1904), 501 steamers, of 460,535 tons, and 5153 sailing vessels of 584,223 tons. Vessels entered, 108,921, of 38,506,365 tons; cleared, 108,858, of 38,505,289 tons. Length of railways (1905), 10,068 miles.
**Exports** (special, 1905), £68,295,000. **Imports,** £83,135,000.

**Jacmel,** a port on S. coast of Hayti. Lat. 18° 13′ N.; long. 72° 32′ W.; 30 m. S. of Port-au-Prince. Pop. 7000. Distance from London, 4284 m.; from Kingston (Jamaica), 285 m.; from Barbados, 812 m.

**Port Accommodation.**—Open bay with anchorage in 4 to 8 fathoms about half a mile from shore. Loading and discharging by lighters. Three small piers.
**Trade.**—Exports: coffee, logwood, orange peel, mahogany, cotton seed, hides, &c.; imports: textiles, hardware, provisions, &c.

**Jaffa,** a port of Syria. Lat. 32° 3′ N.; long. 34° 45′ E.; 57 m. by rail NW. of Jerusalem. Pop. 30,000. Distance from London, 3315 m.; from Alexandria, 266 m.; from Port Said, 138 m. Head of railway to Jerusalem.

**Port Accommodation.**—Open roadstead, with anchorage in 8 fathoms in summer and 10 to 11 fathoms in winter; unsafe in winter.
**Steam Communication.**—Prince line from Manchester.
**Trade.**—Exports: oranges, olive oil, wheat, sesame, barley, cotton,

tupens, water-melons, and soap (1904), £295,300; to U.K., £92,000; imports: coal, iron, timber, textiles, hardware, petroleum, provisions, &c.; £473,320; from U.K., £43,000. B. V.-C.

**Jamaica.**—The largest of the British West Indian islands. Area, including the Turks and Caicos Islands, &c., 4373 sq. m. Pop. 809,138.

**Physical Features.**—Surface mountainous, with the Blue Mountains in the E. rising to 7423 ft.; plains in the S. and W.; the river valleys fertile. Numerous rivers.

**Climate.**—Tropical but healthy; hot in the low lands, but tempered by sea breezes; mean temperature at Kingston, 71.6° to 80.6° F.; at 4000 ft., 55.4° to 60.8° F. Copious rainfall in April, May, September, October; frequent hurricanes.

**Resources and Production.**—Area under cultivation (1904), 774,961 acres, of which 216,221 were under tillage. The chief crops are bananas, sugar-cane, coffee, pimento, and coconuts. The forests furnish cabinetwood, dyewoods, and drugs. Sugar and rum are manufactured. The Turks Islands export annually 1,800,000 bushels of salt to the U.S., Canada, &c., and sponges.

**Shipping and Railways.**—Chief port, Kingston; registered shipping (1904), 5 steamers of 1998 tons, and 82 sailing vessels of 4878 tons. Tonnage entered (1903), 2,104,899. Railway open, 185 miles.

**Exports** (1904-5), £1,436,725, including sugar, £116,396; rum, £92,567; bananas, £514,191; pimento, £136,969; wood and logwood extract, £142,915. **Imports,** £1,672,168. In 1905-6 the exports were worth £1,794,278, and the imports £1,919,909, the shares of the United Kingdom being 19.3 and 48.9 per cent. respectively.

**Japan.**—Area (including Formosa, the Pescadores, and part of Sakhalin), about 176,000 sq. m. Pop. 50,000,000.

**Physical Features.**—All the islands are volcanic and mountainous; earthquakes frequent; rivers mostly short and torrential in character; highest peak Fuji-yama, 12,400 ft.; several lagoons and lakes, the largest being Lake Bieva.

**Climate.**—Humid but healthy, with great range of temperature and abundant rainfall. Mean temperature at Kagoshima, 60.8° F. (Jan. 43.6°; Aug. 79.7°), with 82.4 in. rainfall; Hakodate, 46.5° F. (Jan. 27.9°, Aug. 70.4°), with 44.5 in. rain; Tokyo, 56.3° F. (Jan. 36.4°; Aug. 77.6°), with 60.4 in. rainfall.

**Resources and Production.**—The agriculture area is somewhat limited, owing to mountains incapable of cultivation. The chief crops in 1904 were rice, 255,094,000 bushels; barley, 44,278,000; rye, 34,007,000; and wheat 19,140,000. Tea, sugar, and silk are produced in considerable quantities. About 14,500,000 acres are under forest; among the more valuable trees being the camphor-tree, paper mulberry, vegetable wax-tree, a lacquer-tree, &c., besides pines, oak, beech, maple, chestnut, and bamboos. Mining is actively pursued, among the minerals worked being gold, silver, copper, lead, iron, pyrites, antimony, manganese, coal, sulphur, and petroleum. In 1905, 190,375 tons of iron, 35,693 of copper, and 11,581,755 of coal were produced, and 42,945,600 gallons of kerosene oil. Salt is obtained by evaporation of sea-water, and a large fishing industry is carried on round the coasts.

**Shipping and Railways.**—Principal ports: Koké, Nagasaki, Tokio, and Yokohama, *q.v.* Merchant fleet (1905), 1766 steamers, of 797,674 tons, and 3944 sailing vessels, of 329,234 tons, all of European type, besides a number of vessels of Japanese build. Vessels entered (1905), 8560, of 14,357,326 tons. Length of railways (end of 1905), 7852 miles.

**Exports** (1905), £32,823,222; to U.K., £1,330,000. **Imports,** £49,871,587; from U.K., £11,778,000. Trade in 1906, 85.8 millions.

**Java.**—Area, with Madura, 50,780 sq. m. Pop. (1900), 28,746,638.

**Physical Features.**—Surface mountainous, with numerous volcanoes; fertile and well-watered plains and valleys; S. coast rugged and inaccessible owing to heavy surf; N. coast low and swampy; much of the surface covered by virgin forests.

**Climate.**—Tropical and unhealthy near the coast; more salubrious in the higher parts. Mean annual temperature, 70.6° F.; minimum, 66.2°; maximum, 93.2°. Rainfall about 73 in., mainly between November and March.

**Resources and Production.**—Agriculture is the main industry, the crops grown including rice, maize, cotton, tobacco, indigo, sugar-cane, coffee, cinchona, and tea. The yield of sugar in 1904 was 1,064,935 tons; of coffee, 38,520 tons; of tobacco, 59,274,000 lbs.; of tea, 25,376,000 lbs. Indigo and cocoa are also grown, and 821,608 oz. of sulphate of quinine were sold by the Bandoeng factory. Among minerals found are coal, tin, and petroleum.

**Shipping and Railways.**—Principal ports: Batavia and Soerabaya. Vessels entered (1904), 1775, of 3,937,211 tons. Railways open (1903), 1456 miles.

**Exports** (1904), £13,161,600; to U.K., £1,187,300. **Imports,** £9,054,800; from U.K., £2,909,463.

**Jeddah,** or **Jidda,** a port of Arabia, on the Red Sea. Lat. 21° 28′ N.; long. 39° 13′ E.; 65 miles W. of Mecca. Pop. 18,000. Distance from London, 3958 m.; from Suez, 632 m.; from Suakin, 185 m.

**Port Accommodation.**—Spacious harbour, but obstructed by reefs. Anchorage 1½ m. out in 9½ to 18 fathoms. Loading and discharging by lighters.

**Trade.**—Exports: mother-of-pearl, coffee, gum-arabic, balsam, carpets, hides, and skins (1904), £25,128; imports: corn, rice, tobacco, textiles, incense, &c., £1,405,422. B. C.

**Jersey.** *See* **St. Helier.**

**Jibuti,** a port of French Somaliland, on Tajura Bay, NE. Africa. Lat. 11° 33′ N.; long, 40° 3′ E.; 40 m. W. of Zeila. Pop. 15,000.

**Port Accommodation.**—Fine harbour.
**Steam Communication.**—MM. from Marseilles.
**Trade.**—Exports: ivory, gold, coffee, skins, gum, &c.; imports: general goods.

**Junin,** a port in the N. of Chile. Lat. 19° 45′ S.; long. 70° 10′ W.; 6 m. S. of Pisagua.

**Port Accommodation.**—Anchorage in 7 to 12 fathoms ¾ m. from shore. Mole for loading, and wharf for discharging.
**Steam Communication.**—Cia. Sud-Americana from Valparaiso.
**Trade.**—Exports: nitrate of soda, £1,008,000.

**Kabinda,** a port of Angola, Portuguese W. Africa. Lat. 5° 31′ S.; long. 12° 10′ E.: 40 m. N. Congo mouth.

**Port Accommodation.**—Anchorage in 4 fathoms 1 m. from shore.
**Steam Communication.**—Woermann line from Hamburg.
**Trade.**—Exports: ivory, honey, and wax.

**Kaiser Wilhelm Canal,** 53 m. long. It runs through Holstein from Brunsbüttel to Holtenau, and connects the North Sea with the Baltic. During the twelve months ending March 1906, 33,147 vessels of 5,796,949 tons passed through, 58.35 of the tonnage being German.

**Kalamata,** a port in S. of Greece, on Gulf of Kalamata. Lat. 37° 3′ N.; long. 22° 10′ E.; 17 m. WSW. of Sparta. Pop. 14,298. Distance from Malta, 388 m.

**Port Accommodation.**—Breakwater, 2850 ft. long. Depth at entrance, 36 ft.; in harbour, 21 ft. Safe at all seasons for vessels up to 400 tons.
**Trade.**—Exports: oil, figs, silk cocoons.

**Kalmar,** a fortified port in SE. of Sweden. Lat. 56° 39′ N.; long. 16° 22′ E.; 47 m. NE. of Karlskrona. Pop. (1903), 13,508. Distance from London, 890 m.; from Newcastle, 790 m.

**Port Accommodation.**—Good anchorage in roads in 23 to 40 ft. water. Depth in harbour, 17½ ft.; quayage, 6000 ft.; depth, alongside, 11½ to 16 ft. Harbour depth being increased. Patent slip.
**Trade.**—Exports: timber, paper, limestone, flour, and cattle; imports: coal, salt, pig iron, produce, herrings, seeds, &c. B. V.-C.

**Kamerun.**—Area, 141,120 sq. m. Pop. 3,500,000.

**Physical Features.**—The surface is divided into three zones: a low and narrow coastal strip; a higher and wider stretch of hills and valleys covered with forests; and a plateau with a mean altitude of 2300 to 2600 ft., culminating in the lofty Mongo-ma-Lobo, 13,000 ft. high; well watered, but rivers unfit for navigation on account of rapids and cataracts.

**Climate.**—Tropical, humid, and unhealthy on coast; mean annual temperature (Feb.) 78.8° F.; (July) 84.2° F.; interior better; rainfall varies in different parts, but is copious everywhere; mean at Kamerun, 163.12 inches.

**Resources and Production.**—Cocoa, coffee, rubber, vanilla, &c., are cultivated. Experiments are also being made with cloves, ginger, pepper, and other products; active trade in palm nuts, oil, and ivory; the forests of the interior are rich in timber and other trees. Iron and gold are among the minerals found.

**Shipping and Railways.**—Chief port, Duala (Kamerun), on the Sannaga River, which has a depth on bar from 12 to 18 ft., low and high water. Length of railway open (Victoria-Lisoka), 16 m.

**Exports** (1905), £465,760. **Imports,** £674,355. B. C.

**Karachi,** a port and coaling station of Bombay, India. Lat. 24° 48′ N.; long. 66° 58′ E. Pop. (1901), 116,663. Distance from London, 6158 m.; from Bombay, 483 m.; from Aden, 1464 m.

**Port Accommodation.**—Depths in entrance channel at high water of mean spring and neap tides, 32½ and 29 ft.; mean rise and fall of tides, 7½ and 3¾ ft. Draught allowed for vessels entering or leaving, 28 ft. (fair season), 26 ft. (SW. monsoon). Area of anchorage space, 238½ acres. Quayage, 7610 ft.; high water depths alongside from 12¾ to 36 ft.; low water depths from 4 to 27½ ft. Graving dock, 260¾ ft. long.
**Steam Communication.**—B.I.S.N. and P. and O. from London.
**Trade.**—Exports: grain, oil seeds, cotton, wool, raw silk, dyes, &c. (1904-5), £11,978,467; imports: coal, machinery, metals, timber, provisions, drugs, liquors, &c., £5,135,718.

**Kelung,** a port and coaling station in N. of Formosa. Lat. 25° 7′ N.; long. 121° 53′ E. Distance from Tamsui, 30 m.; from Fu-chau, 150 m.; from Shanghai, 452 m.; from Kobe, 990 m.

**Port Accommodation.**—Depth in outer harbour, 7 fathoms; inner harbour, 2½ fathoms. Loading and discharging by lighters.
**Steam Communication.**—N.Y.K. from Southampton, *viâ* Kobe.
**Trade.**—Exports: coal, rice, camphor, sugar, &c. (1905), £863,272; imports: kerosene, cotton goods, &c., £1,034,479. B. V.-C.

**Kerasund,** a port of Asiatic Turkey, on the Black Sea. Lat. 40° 56′ N.; long. 38° 25′ E. Pop. 8500. Distance from Trebizond, 65 m.; from Batum, 156 m.; from Odessa, 468 m.; from Constantinople, 453 m.

**Port Accommodation.**—Well sheltered anchorage in bay behind a rocky promontory.
**Trade.**—Exports: hazel-nuts, eggs and beans, sheep and goats, £222,000; imports: flour, textiles, metals, &c., £196,000.

**Key West,** a port on a coral island off S. coast of Florida. Lat. 24° 36′ N.; long. 81° 48′ W. Pop. 17,200. Distance from Havana, 93 m.; from New Orleans, 552 m.; from Galveston, 746 m.; from Miami, 147 m.

**Port Accommodation.**—Good harbour; depth on bar, 30 ft.; inside port, 32 to 35 ft. Wharves and warehouses. Patent bow and stern dock; marine railway to take vessels up to 1000 tons.
**Trade.**—Exports: cigars, sponges, turtles, fruits, and vegetables; imports: tobacco from Cuba. B. V.-C.

**Kiau-chau,** a German protectorate in Shantung, China. Area, 200 sq. m.; pop. 32,000. The free port, Tsingtau, is being deepened, and moles and piers are partly constructed. A railway (245 m.) runs from Tsingtau to Tsinan-fu, with a branch to Po-shan.

**Trade.**—Exports: ground-nut and bean oil, straw plait, &c. (1903-4), £737,430; imports: cotton-goods, petroleum, paper, &c., £1,748,690.

**Kiel,** a port, German naval and coaling station, Schleswig-Holstein, on an inlet of the Baltic. Lat. 54° 19′ N.; long. 10° 8′ E. Pop. (1900), 107,977. Distance from London (by Kaiser Wilhelm Canal), 441 m.; from Hull, 396 m.; from Leith, 505 m.; from Hamburg (by rail), 66 m.

**Port Accommodation.**—Accessible to largest vessels; water area of Handelshafen, 40 acres; quayage, 4875 ft., alongside which vessels drawing 18 to 20 ft. can discharge. Government basins for war ships only; depths, 30 and 34 ft. Six Government graving docks and 1 iron dry floating dock. Five floating dry docks, and a common slipway.
**Steam Communication.**—Regular sailings from Copenhagen.
**Trade.**—Exports: grain, flour, and timber; imports: coal, timber, grain, &c. B. V.-C.




**Kilimane (or Quelimane),** a port of Portuguese E. Africa, on the Kwa-kwa R., 12 m. above its mouth. Lat. 18° 1′ S.; long. 36° 59′ E. Pop. 3500. Distance from London, *viâ* Suez, 7105 m.; from Beira, 205 m.; from Mozambique, 337 m.

**Port Accommodation.**—Depth on bar, 9 ft.; rise of spring tides, 12 to 13 ft.; vessels of 16 ft. draft can cross bar.

**Steam Communication.**—U.-C. from Southampton; D.O.A.L. from Hamburg.

**Trade.**—Exports: gold, ivory, rubber, ground-nuts, sesame, wax, indigo, tortoiseshell, &c. (1905), £31,166; imports: dry goods, beads, brass and copper wire, hardware, provisions, &c., £41,671. Consular Agt.

**Kilindini,** a port of British E. Africa, S. of Mombasa. Lat. 4° 8′ S.; long. 39° 40′ E.

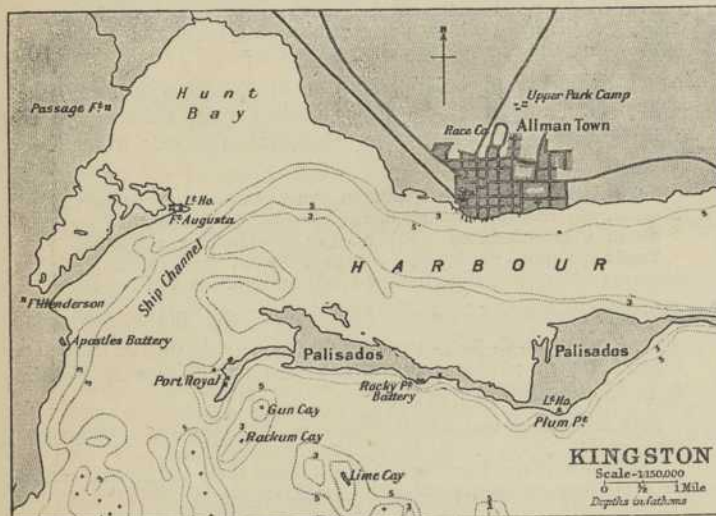
**Port Accommodation.**—Depth in harbour, 33 ft. at low water, ordinary springs. Government pier. Loading and discharging by lighters. Terminus of the Uganda railway.

**Kingston,** a port and Admiralty coaling station, in SE. of Jamaica. Lat. 17° 58′ N.; long. 76° 47′ W. Pop. (1901), 46,542. Distance from London, 4262 m.; from Bermuda, 1168 m.; from Colon, 550 m.; from Baltimore, 1381 m.

**Port Accommodation.**—Spacious land-locked harbour, with depth from 6 to 10 fathoms (possibly altered by the recent earthquake); vessels lie alongside wharves in 4 to 6½ fathoms water. Marine railway, 650 ft. long.

**Steam Communication.**—R.M.S.P. from Southampton; Imperial Direct W.I. Mail from Bristol, and other lines.

**Trade.**—Exports: sugar, coffee, tobacco, rum, cotton, fruits, dyewoods, &c.; imports: wheat, flour, provisions, and manufactured goods.




**Kingstown.** *See* **St. Vincent.**

**Kiu-Kiang,** treaty port of China, on Yang-tse-kiang, near the Poyang-hu. Lat. 29° 40′ N.; long. 116° 5′ E. Pop. 50,000.

**Trade.**—Exports: chiefly tea (1905), £1,828,250; imports: opium, cottons, tin, lead, hardware, sugar, kerosene, &c., £1,465,280. B. C.

**Kobe.** *See* **Hiogo.**

**Konakry,** port of French Guinea. Lat. 9° 30′ N.; long. 13° 40′ W.

**Port Accommodation.**—Jetty, 1066 ft. long.

**Königsberg,** a fortified port of E. Prussia, Germany, on R. Pregel, 6 m. from its mouth in the Frisches Haff. Lat. 54° 52′ N.; long. 20° 29′ E. Pop. (1900), 189,483. Distance from Hull, 952 m.; from Dantzig, 73 m.; from Stettin, 268 m.

**Port Accommodation.**—Depth in port and alongside quayage (10,000 ft.), 16 ft. Pillau Canal (30 m.) available for vessels drawing 13 ft.; new canal (20 m.) with depth of 21¼ ft., under construction. Slipway, 190 ft. long.

**Steam Communication.**—Bailey and Leitham line from Hull.

**Trade.**—Exports: grain, peas, tares, hemp, linseed, rapeseed, flax, timber, textiles, bristles, sugar, bones, mats, feathers, hides, skins, and wax (1904), £4,850,000; imports: coal, iron, steel, tinplates, tea, herrings, salt, flour, wines, &c., £5,800,000. B. V.-C.

**Korea.** *See* **Corea.**

**Kotonu,** a port of Dahomé, W. Africa. Lat. 6° 27′ N.; long. 2° 27′ E.

**Port Accommodation.**—Open roadstead with anchorage in 6 fathoms water, close to shore. Iron pier.

**Steam Communication.**—Woermann line from Hamburg.

**Trade.**—Exports: palm-oil.

**Kuching,** a port of British Borneo, on the Sarawak R., 23 m. from its mouth. Lat. 1° 32′ N.; long. 110° 19′ E.

**Port Accommodation.**—River unsafe for vessels drawing over 16 ft. Depths alongside wharves at high and low water, 24 to 30 ft., and 14 to 19 ft.

**Trade.**—Exports: rice, timber, edible birds' nests, beeswax, pepper, canes, camphor, metals, indiarubber, sago, &c.; imports: cloth, brassware, salt, opium, hardware, provisions, &c.

**Kustenji.** *See* **Constantza.**

**Labuan,** island and port and coaling station (Victoria Harbour) off NW. coast of Borneo. Lat. 5° 20′ N.; long. 115° 18′ E. Pop., 8000. Distance from London, 8970 m.; from Singapore, 725 m.

**Port Accommodation.**—Two coaling wharves; depths alongside, 25 ft. and 15 ft.; depth at coaling pier, 29 to 30 ft.

**Trade.**—Largely a transit one. Exports: sago, edible birds' nests, beeswax, camphor, indiarubber, gutta-percha, rattans, trepang, &c. (1905), £130,135; imports: general merchandise, £108,766.

**Lagos,** port and naval coaling station, on Bight of Benin, W. Africa. Lat. 6° 26′ N.; long. 3° 25′ E. Distance from Liverpool, 4097 m.; from St. Helena, 1447 m.; from Duala, 430 m.

**Port Accommodation.**—Accessible to vessels up to 10½ ft. Loading and discharging by surf-boats. Anchorage off town in 2 to 3 fathoms.

**Steam Communication.**—Elder-Dempster line from Liverpool, &c.

**Trade.**—Exports: palm-oil, nuts, cotton, ivory, gum, copal, £1,211,000; imports: salt, spirits, crockery, bread, rice, gunpowder, &c., £920,000.

**Lagos.**—British colony on the Guinea coast, now styled the Colony of S. Nigeria. Area of colony, 3460 sq. m.; of Protectorate, 25,450 sq. m. Pop. 1,500,000.

**Physical Features.**—The island of Lagos, which is low and marshy, is separated from the mainland by a broad lagoon; coast of mainland dense forest; interior open, cultivated, undulating plain.

**Climate.**—Unhealthy for Europeans. Mean temperature, 82° F.; rainfall, 74 in.

**Resources and Production.**—The principal crops grown are maize, yams, cassava, plantains, earth-nuts, and fruits; the other products are palm-oil and kernels, ivory, gum, copal, rubber, cotton, cocoa, and coffee.

**Shipping and Railways.**—Regular communication by Elder-Dempster, and Woermann lines. Length of railway, Lagos to Ibadan, 124 miles.

**La Guaira,** port of Venezuela. Lat. 10° 36′ N.; long. 66° 56′ W.; 23½ m. by rail from Caracas. Distance from Liverpool, 4094 m.; from Kingston (Jamaica), 726 m.; from Santiago, 768 m.

**Port Accommodation.**—Depth at entrance at high and low water springs, 48 ft. and 46½ ft.; quayage, 4520 ft.; depth alongside, 10 to 40 ft.; in basin, 11 to 14 ft.

**Trade.**—Exports: coffee, cocoa, hides, cotton, indiarubber, &c. (1904-5), £585,139; imports: coal, machinery, wines, provisions, manufactured goods, &c. B. V.-C.

**La Pallice,** a port of France. Lat. 46° 15′ N.; long. 1° 12′ W.; 3½ m. N.W. of La Rochelle.

**Port Accommodation.**—Depth over sill at high water springs and neaps, 32 ft. 2 in., and 30 ft.; quayage, 5556 ft.; jetties, 2533 ft.; 2 dry docks.

**Steam Communication.**—P.S.N. from Liverpool.

**Trade.**—Exports: wines, brandy, oysters, fresh vegetables, &c.; imports: coal, ore, timber, petroleum, jute, guano, &c.

**La Plata,** port and coaling station (Ensenada, 3 m. from the city), Argentine Republic. Lat. 34° 47′ S.; long. 57° 52′ W.; 50 m. S.E. of Buenos Ayres.

**Port Accommodation.**—Accessible to vessels drawing 22 ft.; the Grand Dock, for vessels drawing 25 ft.

**Steam Communication.**—R.M.S.P. from Southampton; Houlder from London; Houston from Liverpool, &c.

**Trade** largely a transhipment one. Exports: live stock, beef, hides, horns, wool, feathers, &c.; imports: manufactures, textiles, coal, iron, hardware, timber, leather, gunpowder, &c. B. V.-C.

**La Rochelle,** port and coaling station, France, on Bay of Biscay. Lat. 46° 9′ N.; long. 1° 31′ W. Pop. (1901), 31,560. Distance from Liverpool, 594 m.; from Newcastle, 830 m.

**Port Accommodation.**—High water depths at ordinary springs and neaps, 22 ft. and 20 ft.; in docks from 11¾ ft. to 22 ft. 1 in., and 8 ft. to 18 ft. 7 in. A gridiron, patent slip, and 3 slipways.

**Steam Communication.**—P.S.N. from Liverpool.

**Trade.**—Exports: wine, brandy, oysters, fresh vegetables, superphosphates, &c.; imports: coal, timber, wines, phosphates, bones, jute, machinery, coal-tar, &c. B. V.-C.

**La Union,** a port of Salvador, on Gulf of Fonseca. Lat. 13° 15′ N.; long. 87° 55′ W., 104 m. from San Salvador.

**Port Accommodation.**—Landlocked harbour with 4 to 5 fathoms water; rise of spring tides, 10 ft. Loading and discharging by lighters.

**Trade.**—Exports: indigo. B. V.-C.

**Lamu,** a port of British E. Africa. Lat. 2° 43′ S.; long. 40° 56′ E. Distance from London, 6345 m.; from Mombasa, 132 m.; from Aden, 1476 m.

**Port Accommodation.**—Anchorage in harbour for largest vessels. Vessels drawing 18 ft. can enter at low water.

**Steam Communication.**—B.I.S.N. from London.

**Trade.**—Exports: grain, ivory, rubber, gum, horns, wax, skins, &c.; imports: cotton goods, powder, rum, &c.

**Laraiche (El Arish),** a port in NW. of Morocco. Lat. 35° 12′ N.; long. 6° 9′ W. Pop. 6000. Distance from Tangier, 43 m.; from Rabat, 74 m.

**Port Accommodation.**—Anchorage for large vessels in open and exposed roadstead; vessels drawing up to 11 ft., 1000 ft. anchor within the bar. Discharging by lighters.

**Steam Communication.**—Forwood line from London; Cia. Transatlantica from Cadiz; Woermann from Hamburg.

**Trade.**—Exports: canary seed, beans, wool, hides, skins, sheep, wax, &c. (1904), £89,642; imports: cottons, candles, coffee, pepper, hardware, &c., £379,852. B. V.-C.

**Larnaca,** a port on S. coast of Cyprus. Lat. 34° 55′ N.; long. 33° 28′ E. Distance from London, 3285 m.; from Beirut, 111 m.; from Port Said, 228 m.

**Port Accommodation.**—Open roadstead with 8 to 12 fathoms in summer, and 10 to 16 fathoms in winter. Pier 450 ft. long, with 7 to 8 ft. water alongside. Iron jetty, and lighters.

**Steam Communication.**—Papayanni line from Liverpool.

**Trade.**—Exports: grain, cotton, raisins, oranges, lemons, gypsum; imports: sugar, hides, leather, timber, soap, coffee, petroleum, and general merchandise.

**Las Palmas,** port and coaling station on Grand Canary, Canary Islands. Lat. 28° 7′ N.; long. 15° 24′ W. Distance from Southampton, 1529 m.; from Cadiz, 685 m.; from Gibraltar, 701 m.

**Port Accommodation.** — Good anchorage in roadstead, ante-port and port. Water area, 287 acres. High and low water depths at entrance, 60 ft. and 53 ft.; quayage, 6026 ft.; high and low water alongside, 42 ft. and 35 ft. Lighters and water-boats. Patent slip to take vessels 230 ft. long, with 17 ft. draft.

**Steam Communication.** —Union-Castle from Southampton; Woermann from Hamburg, &c.

**Trade.** — Exports: cochineal, fruit, potatoes, wine; imports: soap, textiles, wheat, tinned provisions, iron wares, &c. B. V.-C.

**Launceston,** a port in N. of Tasmania, on R. Tamar, about 40 m. from its mouth. Lat. 41° 30′ S.; long. 147° 14′ E.; 133 m. by rail N. of Hobart. Pop. (1901), 21,153. Distance from Melbourne, 263 m.; 545 m. from Sydney.

**Port Accommodation.**—Good anchorage within the Heads, in 7 to 10 fathoms; vessels of 4000 tons can ascend the river at high water. Depths at high and low springs (Queen's Wharf), 22 and 12 ft.; (Market Wharf), 8 ft. and nil; (Railway Wharf), 22 ft. (high water); (Town Pier), 23 ft. and 13 ft. Wharfage, 4298 ft. Floating dry dock, 160 ft. long.

**Steam Communication.**—Union S.N. Co. of N.Z. from Melbourne and Sydney.

**Trade.**—Exports: wheat, oats, fodder, wool, timber, copper, tin, lead, gold, silver, fruits, &c.; imports: coal and general merchandise. Value of trade, £1,760,000.

**Laurvik,** a port of Norway. Lat. 59° 4′ N.; long. 10° 3′ E., 98 m. by rail S. of Christiania.

**Port Accommodation.**—Depth in harbour, 90 to 150 ft.; quayage, 796 ft.; depths alongside, 15 to 24 ft.

**Trade.**—Exports: timber, wood-pulp, granite, fish (1904), £112,800; imports: coal, grain, marine stores, &c., £201,700. B. V.-C.

**Leeward Islands.**—These comprise Antigua, Barbuda and Redonda, Virgin Islands, Dominica, St. Kitts, Nevis, Anguilla, and Montserrat. Area, 700 sq. m. Pop. (1901), 127,600.

**Physical Features.**—Most of the islands are of volcanic origin, and are mountainous and well watered.

**Climate.**—Generally healthy. Mean annual temperature about 78° F., but less in the uplands. There are generally two wet and two dry seasons.

**Resources and Production.**—The staple products are sugar and molasses, lime-juice (Montserrat and Dominica), rum, coffee, cocoa, arrowroot, onions, pine-apples, and other fruits; tobacco and cotton are being tried. Phosphate of lime occurs on Redonda and Barbuda.

**Shipping.**—Tonnage entered (1904), 1,085,737; cleared, 1,083,976.

**Exports** (1905), £423,737 **Imports**, £420,806.

**Leghorn,** a port and coaling station, Italy, on the Ligurian Sea. Lat. 43° 33′ N.; long. 10° 20′ E., 62 m. by rail from Florence. Pop. 98,320. Distance from London, 2438 m.; from Genoa, 78 m.; from Naples, 264 m.

**Port Accommodation.**—Spacious harbour with good anchorage throughout. Depths (Mediceo Harbour), 20 to 24 ft.; (Mandraccio Darsena), 18 to 19 ft.; (Diga Rettilinea), for vessels up to 19½ ft. draft; (Capitaneria quay), 26½ ft. No bar. Loading and discharging by lighters.

**Steam Communication.**—Anchor line from Glasgow.

**Trade.**—Exports: hides, hemp, olive oil, marble, fruit, coral, borax, soap, rags, straw hats, &c. (1905), £2,199,930; imports: grain, coal, tobacco, fish, iron, textiles, sulphur of copper, coffee, jute, petroleum, &c., £3,444,560. B. V.-C.

**Leith,** a port and coaling station on Firth of Forth. Lat. 55° 59′ N. long. 3° 10′ W., 2 m. from Edinburgh. Pop. (1901), 76,667. Distance by sea from London, 418 m.; from Glasgow (by Caledonian Canal), 450 m.; from Newcastle, 117 m.




**Port Accommodation.**—Water area about 100 acres; quays and jetties 24,800 ft. Depth at entrance to outer harbour at high and low water ordinary springs, 27½ ft. and 10 ft.; inner harbour, 18½ ft. and nil. Depths in docks at high water (Edinburgh Dock, Albert Dock), 25¾ ft. ordinary springs; 22 ft. ordinary neaps; 26½ ft. highest springs; 20½ ft. lowest neaps. Imperial Dock, 5 ft. deeper. Albert Basin, 27 ft. and 22½ ft. ordinary springs and neaps; Victoria Dock, 23 ft. and 20 ft.; Old Docks, 17½ and 14 ft. ordinary springs and neaps. Eight dry docks, 410, 325, 300, 266, 176, 174, 500, and 180 ft. long.

**Steam Communication.**—Frequent communication with London, Norway, Germany, &c.

**Trade.**—Exports: coal, herring, cotton manufactures, linen goods, iron and steel manufactures, machinery, millwork, spirits, &c. (1905), £5,221,906; imports: grain, sugar, butter, eggs, cheese, flour, glass, paper, wines, spirits, manures, &c., £12,754,972.

**Leixões,** a port of Portugal, 2 m. N. of the mouth of the Douro. Lat. 41° 10′ N.; long. 80° 42′ W., 6 m. from Oporto, of which it is the port. Distance from London, 877 m.; from Liverpool, 837 m.; from Lisbon, 174 m.

**Port Accommodation.**—Accessible to largest vessels at all tides. Depths of water in harbour at low water springs, from 28 to 48 ft.; rise of spring and neap tides, 7 to 12½ ft., and 2¼ to 7½ ft. Loading and discharging by lighters.

**Steam Communication.**—Pacific S.N. Co. from Liverpool; R.M.S.P. from Southampton.

**Trade.**—Exports: wine, oil, fruit, cork, wool, salt, leather, &c.; imports: general merchandise. B. V.-C.

**Levuka,** a port on Ovalau Island, Fiji. Lat. 17° 40′ S.; long. 178° 45′ E. Distance from London, 12,345 m.; from Sydney, 1786 m.

**Port Accommodation.**—Good anchorage. No bar. Queen's Wharf. 6215 ft. long, with depths alongside at high and low water of 23 to 35 ft., and 18 to 30 ft.

**Trade.**—Exports: cotton, oil, sugar-cane, fruits, trepang, tortoise-shell, &c.; imports: textiles, Birmingham wares, agricultural implements, provisions, wines, and spirits.

**Libau,** a port of Russia, on the Baltic. Lat. 56° 32′ N.; long. 20° 57′ E. Pop. 64,500. Distance from Hull, 938 m.; from Riga, 174 m.; from Stettin, 318 m.

**Port Accommodation.**—Harbour being dredged to a depth of 22 ft.; quayage, 19,527 ft.; depths of water from 12 to 19 ft.; quayage of new harbour, 1715 ft.; depth of water, 26 ft. Government floating dock, and two dry docks.

**Steam Communication.**—Wilson line from Hull, &c.

**Trade.**—Exports: rye, barley, oats, flax, wool, linseed, hides, sleepers, &c. (1905), £5,336,857; to U.K., £1,662,780; imports: coal, iron, steel, herrings, cotton, copra, manures, cork, chemicals, dyewoods, &c., £1,378,883; from U.K., £673,049. B. V.-C.

**Liberia.**—Area, 36,840 sq. m. Pop. 1,500,000.

**Physical Features.**—Coast strip flat; succeeded by a swamp; then forest and undulating plain as far as the Kong Mountains in the interior; well watered by numerous rivers; lower parts subject to flooding during rainy season.

**Climate.**—Dry season from November to April, during early part of which the harmattan blows, drying up the swamps, streams, and creeks; wet season seven months; mean temperature, 75° F.; rarely rises above 87° F.

**Resources and Production.**—Soil fertile, but agriculture much neglected. Cotton, cocoa, coffee, rice, and millet are grown; ivory, piassava fibre, palm-oil and kernals are exported; ginger and pepper are grown, and bees-wax is collected. The forests yield valuable rubber trees of different species. Gold and iron are among the minerals found.

**Shipping.**—Principal port, Monrovia, *q.v.* Vessels entered (1904), 180, of 200,000 tons; cleared, 175, of 272,000 tons. No railways.

**Limasol,** port on S. coast of Cyprus. Good roadstead. Screw pile pier, with 18 ft. of water at end.

**Limon,** chief port of Costa Rica, on the Caribbean coast. Lat. 10° N., and long. 83° 2′ W.; 2017 m. from New York, and 608 m. from Kingston, Jamaica.

**Port Accommodation.**—Excellent harbour for vessels of all sizes. Depth of 22 to 30 ft. alongside wharf.

**Steam Communication.**—R.M.S.P. from Southampton; Atlas line from New York. B. V.-C.

**Lingah,** port, Persia, 100 m. W. of Bunder Abbas. Lat. 26° 33′ N.; long. 54° 54′ E. Pop. 20,000. Distance from Bombay, 1365 m.

**Port Accommodation.**—Anchorage in 5 fathoms, half a mile off shore.

**Steam Communication.**—B.I.S.N. from Bombay.

**Trade.**—Exports: carpets, drugs, pearl and tortoise shells, canvas, &c.; imports: coffee, crockery, metals, indigo, rice, sugar, tea, timber, &c.

**Lisbon,** port and coaling station, Portugal, on the Tagus, 9 m. from the sea. Lat. 38° 42′ N.; long. 9° 6′ W. Pop. 356,000. Distance from London, 1035 m.; from Liverpool, 998 m; from Gibraltar, 302 m.



**Port Accommodation.**—Quayage, 13,838 ft. Depths from 21 to 33 ft. Five dry docks and a patent slip.
**Steam Communication.**—R.M.S.P. from Southampton; P.S.N. from Liverpool; D.O.A.L. from Hamburg, &c.
**Trade.**—Exports: wines, fruits, salt, oil, wool, leather, cattle, and cork; imports: general merchandise. B. C.

**Liverpool,** port and coaling station, Lancashire, on R. Mersey. Lat. 53° 25′ N.; long. 3° W., 201 m. by rail NW. of London. Pop. (with Birkenhead), 795,873. Distance from Dublin, 124½ m.; from Belfast, 141½ m.; from Glasgow, 210 m.; from Manchester, 40½ m.

**Port Accommodation.**—Length of quayage, 26½ m.; at Birkenhead, 9 m.; total water area, 575 acres; depths in the cut over bar at high water ordinary springs and neaps, 55 and 48 ft.
**Trade.**—Exports (1905): £138,285,465; imports: £139,295,487.




**Livingston,** a port of Guatemala. Lat. 15° 49′ N.; long. 88° 47′ W.

**Port Accommodation.**—Anchorage about 2 m. from shore in 4 to 6 fathoms.
**Steam Communication.**—Central America S.S. Co. from New York.
**Trade.**—Exports: bananas coffee, rubber, mahogany, hides, &c.; imports: machinery, soap, wines, spirits, beer, provisions, textiles, and hardware. B. V.-C.

**Loanda.** *See* **St. Paul de Loanda.**

**Loango,** a port of French Congo, 397 m. S. of Libreville. Lat. 4° 38′ S.; long. 11° 53′ E.

**Steam Communication.**—Elder-Dempster from Liverpool; Woermann from Hamburg.
**Trade.**—Exports: palm-oil, gums, wax, archil, copper, ivory, &c.

**London,** port and coaling station on the Thames. Lat. 51° 30′ N.; long. 0° 5′ W. Pop. (1901), 4,536,541; of Greater London, 6,581,372.

**Port Accommodation.**—Lowest depth in navigable channel, 24 ft. at low water ordinary springs, about a mile above Southend. Four principal dock companies—the London and St. Katharine's, the East and West India (owners also of the docks at Tilbury and the Milwall on the north side of the river, and the Surrey Commercial docks on the south). Area of docks, 448 acres. The Royal Albert Dock No. 1 has a depth of 36 ft. on sill at Trinity high water, and the Tilbury main dock, 45 ft.
**Trade.**—Exports (1905): £103,943,735; imports: £181,061,265.




**Lourenço Marques,** port and coaling station, on Delagoa Bay, Portugese E. Africa. Lat. 26° S.; long. 33° E. Pop., 6370. Distance from London, *viâ* Cape, 7292 m.; from Durban, 300 m.

**Port Accommodation.**—Anchorage in 9 fathoms; depth on bar, 27 ft. Discharging by lighters, or at wharf.
**Steam Communication.**—N.C. from London; M.M. from Marseilles; D.O.A.L. from Hamburg.
**Trade.**—Exports: gold, wool, and hides from the Transvaal (1905), £41,511; to U.K., £35,957; imports: timber and general goods, £1,042,507; from U.K. and British Possessions, £354,357.

**Lübeck,** a port of Germany, on the Trave, 12 m. from its mouth in the Baltic. Lat. 53° 52′ N.; long. 10° 41′ E. Pop. 82,100.

**Port Accommodation.**—Quayage, 8000 ft.; depths, 19 to 20 ft. Floating dry dock.
**Trade.**—Exports: wines, spirits, coffee, sugar, and general goods (1904), £16,730,000; imports: coal, iron, cotton, silk, timber, produce, &c., £16,465,000. B. V.-C.

**Luleå,** a port of NE. Sweden, on Gulf of Bothnia. Lat. 65° 35′ N.; long. 22° 8′ E. Pop. 10,000. Distance from Stockholm, 411 m.

**Port Accommodation.**—Quayage and piers, 9727 ft. Depths, 22 to 40 ft. Patent slip.
**Trade.**—Exports: iron ore and timber; imports: coal, rye, timber. B. V.-C.

**Lunenburg,** a port of Nova Scotia. Lat. 44° 22′ N.; long. 64° 31′ W. Distance from Halifax by water, 45 m. Pop. 2000.

**Port Accommodation.**—Quayage, 300 ft.; high water depths, 16 to 18 ft. Marine railway.
**Trade.**—Exports: chiefly fish and lobsters (1904), £114,500; imports: £69,000.

**Luxemburg.**—Area, 1000 sq. m. Pop. (1900), 236,543.

**Physical Features.**—Hilly in the N. and W.; S. and central parts undulating plain; watered by the Moselle, Saure, and Alzette.
**Climate.**—Variable, and cold on the slopes of the Ardennes.
**Resources and Production.**—There is a considerable forest area; chief products of agriculture are wheat, barley, flax, hemp, wine, fruit, &c. Mining and smelting are the chief industries.
**Railways.**—Length of lines open, 680 miles.
**Exports** and **Imports** are included in the German Zollverein.

**Lyttelton,** a port and coaling station of S. Island, New Zealand. Lat. 43° 36′ S.; long. 172° 49′ E., 7 m. from Christchurch. Distance from London, *viâ* Suez, 12,417 m.; from Wellington, 178 m.; from Cape Horn, 4600 m.

**Port Accommodation.**—Berthage of upwards of 11,000 ft. for largest vessels. High water depths of ordinary springs, 31⅞ ft. Graving dock and patent slip.
**Steam Communication.**—N.Z.S. Co. from London; Union S.S. Co. to Melbourne, Sydney, &c.
**Trade.**—Exports: wool, grain, frozen meat, fruits, skins, hides, &c., £3,456,000; imports: general merchandise, £1,914,000.

**Macao,** port belonging to Portugal, on island at mouth of Canton River, China. Lat. 22° 11′ N.; long. 113° 34′ E. Pop. 64,000. Distance from Singapore, 1429 m.; Canton, 88 m.

**Port Accommodation.**—Anchorage in 4 fathoms, 6 m. from lighthouse; high-water depth on bar, 12 ft.; in harbour, 18 ft.
**Trade.**—Exports: tobacco, preserves, and essential oils, and a transit trade in tea, silks, &c.; imports: opium, kerosene, rice, piece goods, &c. B. V.-C.

**Macassar,** a port in the SW. of Celebes, Dutch E. Indies. Lat. 5° 10′ S.; long. 119° 32′ E. Pop. 20,000. Distance from Batavia, 786 m.; Soerabaya, 452 m.; Banjermassin, 350 m.

**Port Accommodation.**—Safe anchorage; depth at entrance, 60 ft.
**Steam Communication.**—Paketvaart Maatschappij to Java, Singapore, &c.
**Trade.**—Exports include spices, coffee, gum, mother-of-pearl, gutta-percha, &c.; imports are cotton, opium, liquors, wrought metals, &c. B. V.-C.

**Maceio,** a port of Brazil. Lat. 9° 35′ S.; long. 35° 41′ W. Pop. 15,000. Distance from London, 4250 m.

**Port Accommodation.**—Open harbour with safe anchorage; high-water depths, 24 to 36 ft.
**Steam Communication.**—R.M.S.P. from Southampton.
**Trade.**—Exports: sugar, cotton, cotton seed, maize, and hides, £245,000; imports: general goods, £237,000. B. V.-C.

**Mackay,** a port of Queensland, on S. bank of Pioneer R. Lat. 21° 9′ S.; long. 149° 13′ E.; 625 miles NW. of Brisbane. Pop. 5200.

**Port Accommodation.**—Good anchorage in 5 fathoms, 3½ m. from wharves. Steam lighters.
**Steam Communication.**—B.I.S.N. Co. from London.
**Trade.**—Exports: sugar.

**Madagascar.**—Area, 224,000 sq. m. Pop. 3,000,000.

**Physical Features.**—Traversed from N. to S. by a chain of mountains, with cross ranges, isolated peaks, and plateaus between; the E. surface slopes abruptly to the low land along the Indian Ocean; much of the interior is forest clad; well watered by numerous rivers and mountain torrents.
**Climate.**—Hot and unhealthy on the coast; more salubrious in the higher lands; mean annual temperature at Tamatave, 75.2° F.; rainfall, 121 in.; relative humidity, 84.
**Resources and Production.**—Agriculture and cattle-breeding are the chief occupation, the principal crops grown being rice, manioc, sugar, coffee, cotton, cacao, vanilla, tobacco, and sweet potatoes. The forests yield valuable timber, caoutchouc, gums, resins, textile, tanning, dyeing, and

medicinal plants. Silk culture is also pursued. Among minerals found are gold, iron, copper, lead, silver, zinc, antimony, manganese, nickel, sulphur, graphite, and lignite. There is a preserved meat establishment in Diego Suarez province.

**Shipping and Railways.**—Principal port, Tamatave, *q.v.* Vessels entered (1905), 6471 of 1,198,177 tons, of which 4277 vessels of 1,983,347 tons were French. Length of railway open, 92 m.

**Exports** (1905), £902,160; to U.K., £44,915. **Imports,** £1,247,936; from U.K., £11,437. The chief articles of export in 1905 were gold, £275,000; rubber, £193,600; hides and skins, £148,400; raphia, £105,100; and cattle, £43,000.

**Madeira,** island, port, and coaling station (Funchal) in the North Atlantic. Lat. 32° 38′ N.; long. 16° 54′ W. Pop. 151,000. Distance from Southampton, 1306 m.; Lisbon, 535 m.

**Port Accommodation.**—Vessels anchor in 8 to 12 fathoms, 2 cables from shore.

**Steam Communication.**—Union-Castle line, &c., from Southampton.

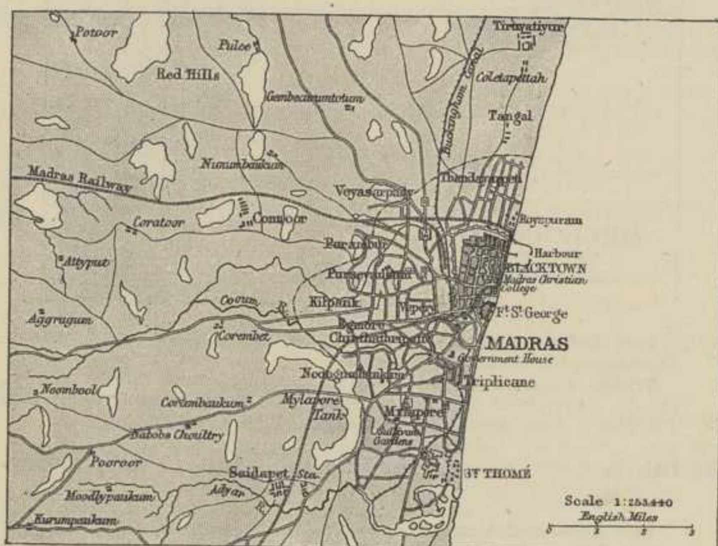
**Trade.**—Exports: wines, sugar, tobacco, fruits and vegetables (1905), £211,896; to U.K., £38,782; imports: £438,231; from U.K., £187,631. B. C.

**Madras,** port and coaling station, India. Lat. 13° 4′ N.; long. 80° 12′ E. Pop. 509,500. Distance by sea from London, 7491 m.; from Calcutta, 770 m.

**Port Accommodation.**—Water area, 200 acres; depth at entrance, 37 ft.; at pier head, 25 ft. Loading and discharging by lighters.

**Steam Communication.**—B.I.S.N. from London, and other lines.

**Trade.**—Exports: cotton, sugar, indigo, rice, hides, cocoa-nut oil, oil-seeds, pepper, &c. (1904–5), £3,378,141; imports: cotton, hardware, wines, provisions, manufactured goods, &c., £4,677,344.




**Mahé,** island, port (Victoria), and naval coaling station, Seychelles. Lat. 4° 10′ S.; long. 55° 43′ E. Distance from Mombasa, 955 m.; Bombay, 1747 m.; Colombo, 1684 m.

**Port Accommodation.**—Good anchorage; high-water depth in port, 60 ft.

**Steam Communication.**—B.I.S.N. from London; M.M. from Marseilles.

**Trade.**—Exports: vanilla, cocoa-nut oil, soap, tortoiseshell, coffee, cocoa, nuts, cloves, &c., £53,500; imports: £60,300.

**Mahon,** port of Minorca, Balearic Islands. Lat. 39° 52′ N.; long. 4° 13′ E. Distance from Barcelona, 142 m.

**Port Accommodation.**—Harbour depth, 40 to 60 ft.; quayage, 6562 ft.; depth alongside, 20 to 25 ft.

**Trade.**—Exports: shoes, cotton goods, and cheese. B. V.-C.

**Majunga,** a port on NW. coast of Madagascar. Lat. 15° 43′ S.; long. 46° 22′ E. Distance from Zanzibar, 710 m.; Aden, 2036 m.; Delagoa Bay, 1080 m.

**Port Accommodation.**—Deep natural harbour with safe anchorage; river Ikopa navigable for small boats to within 90 m. of Antananarivo.

**Steam Communication.**—M.M. from Marseilles.

**Trade.**—Exports: cattle, rubber, hides, poultry, rice, tobacco, gum; imports: textiles, rum, absinthe, provisions, hardware, apparel. B. V.-C.

**Malaga,** a port on S. coast of Spain. Lat. 46° 43′ N.; long. 4° 26′ W. Pop. 130,100. Distance from London, 1400 m.; Gibraltar, 62 m.; Melilla, 114 m.

**Port Accommodation.**—Quayage, 6600 ft.; depth alongside, 20 to 28 ft.

**Steam Communication.**—Hull and Spanish lines from London; Ca. Transatlantica from Cadiz, &c.

**Trade.**—Exports: wines, fruits, olive oil, brandy, anchovies, esparto grass, lead, &c., £2,208,000; imports: coal, machinery, naval stores, textiles, petroleum, colonial produce, £1,597,000. B. C.

**Malay States and Johore.**—The Federated Malay States comprise Perak, Selangor, Negri Sembilan, and Pahang. Area, 26,380 sq. m. Pop. 678,600. Area of Johore, 9000 sq. m. Pop. 200,000.

**Physical Features.**—Coast lands flat, with mangrove swamps; interior traversed by mountain chains, broken here and there by wide valleys; much of the surface covered by forests and dense jungle; rivers numerous, but few navigable, and that only for native boats or small vessels.

**Climate.**—Hot, humid, and unhealthy, especially in the low-lying parts; temperature seldom above 90° F.; visited by both NE. and SW. monsoons; rainfall, 112 in.

**Resources and Production.**—Among the products of agriculture are Liberian coffee, pepper, sugar, rice, sago, gambier, tapioca, &c.; the forests yield rubber, gutta-percha, valuable building timber, oils, resins, bamboo and other canes, fruits, &c. The principal minerals worked are gold and tin, the latter being plentiful in the peninsula; others are lead, iron, copper, bismuth, mercury, arsenic, manganese, plumbago, silver, and zinc.

**Shipping and Railways.**—Length of railways, 342 m., connecting the principal mining centres with the sea and river ports.

**Exports** of Federated Malay States (1905), £8,003,000. **Imports,** £4,858,000.

**Malmö,** fortified port and coaling station in S. of Sweden, on the Sound. Lat. 55° 37′ N.; long. 13° E. Pop. 67,400. Distance from Hull, 627 m.; Copenhagen, 16 m.

**Port Accommodation.**—Length of docks, &c., 13,060 ft.; depth, 17 to 23¾ ft. Dry dock and patent slip.

**Steam Communication.**—Wilson line from Hull.

**Trade.**—Exports: flour, bacon, beef, gloves, millboard, wood pulp, matches, cattle, butter, chalk, timber, &c.; imports: coal, grain, oils, iron, machinery, fish, &c. B. V.-C.

**Malta,** fortified island, port (Valetta), naval base and coaling station in the Mediterranean. Lat. 35° 54′ N.; long. 14° 31′ E. Pop. 197,000. Distance from London, 2308 m.; Gibraltar, 991 m.; Alexandria, 820 m.

**Port Accommodation.**—Depth in harbour, 12 fathoms; good anchorage. Royal dockyard, dry docks, and pontoons; new breakwater.

**Steam Communication.**—P. and O. from London; Moss line from Liverpool, &c.

**Trade.**—Exports: potatoes, onions, oranges, grain, pulse, silk, cotton, figs, &c. (1905–6), £7,156,848; to U.K., £2,314,079; imports: coal, textiles, naval stores, and general goods, £8,388,492; from U.K., £221,988.

**Manaos,** river-port Brazil, on Rio Negro, 10 m. above its junction with the Amazon. Lat. 3° 0′ S.; long. 60° 2′ W. Pop. 20,000.

**Port Accommodation.**—Slipway.

**Steam Communication.**—Booth line from Liverpool.

**Trade.** — Exports: chiefly rubber (1904), £5,615,000; imports: £1,220,400. B. V.-C.

**Manchester,** port on Ship Canal, Lancashire, 35½ m. from its entrance into the Mersey. Lat. 53° 29′ N.; long. 2° 14′ W. Pop. 544,000; Salford, 221,000. Distance by canal from Liverpool, 40½ m.; Glasgow, 240½ m.

**Port Accommodation.**—Average width of canal at bottom, 120 ft.; depth, 26 ft.; on upper sills of locks, 28 ft. Water area of docks, 105 acres; quayage over 5 m. Dry docks and pontoons.

**Trade.**—Exports are textiles of all kinds, machinery, coal, chemicals, iron and steel manufactures, &c. (1905), £13,575,000; imports are cotton, food stuffs, metals, timber, chemicals, paraffin, petroleum, paper, straw-board, &c., £23,003,000. In 1905 the tonnage that passed through the canal was 4,250,000.

**Manila,** port and coaling station of Luzon, Philippines. Lat. 14° 36′ N.; long. 121° 2′ E. Pop. 220,000. Distance from London, 9750 m.; Singapore, 1343 m.; Hong-Kong, 640 m.

**Port Accommodation.**—Quayage, 4250 ft. Large vessels anchor in bay. Patent slipways and large floating dock.

**Steam Communication.**—N.Y.K. from Southampton; C.T. from Liverpool.

**Trade.**—Exports: sugar, hemp, tobacco, cigars, cordage, indigo, coffee, cotton, &c.; imports: textiles, drugs, jewellery, clocks, &c. B. C.

**Maracaibo,** a port of Venezuela. Lat. 10° 38′ N.; long. 71° 42′ W. Pop. 34,300. Distance from Liverpool, 4244 m; Curaçao, 217 m.

**Port Accommodation.**—Commodious deep-water harbour, closed by a bar with only 12 to 14 ft. of water.

**Trade.**—Exports: coffee, cocoa, dividivi, fustic, boxwood, lignum-vitæ, &c. B. V.-C.

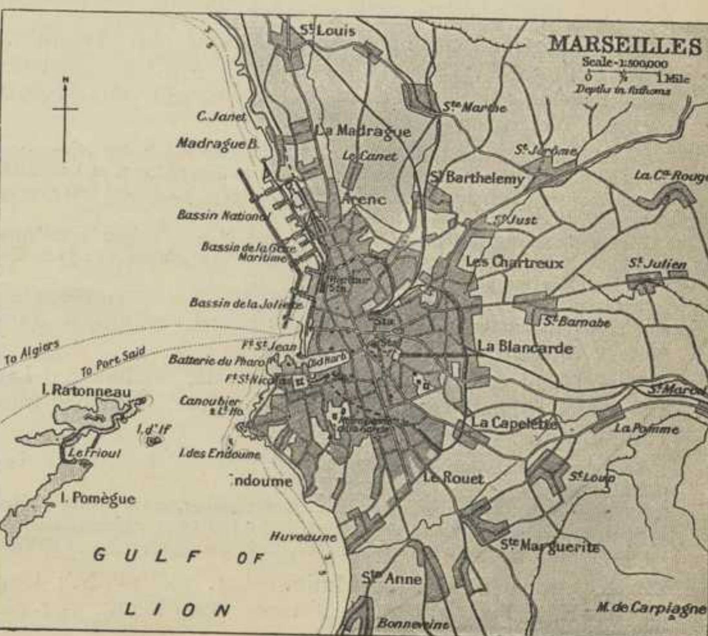
**Maranhão** (S. Luiz de), port and coaling station on N. coast Brazil. Lat. 2° 31′ S.; long. 44° 18′ W. Pop. 30,000. Distance from Liverpool, 4038 m.; Ceara, 374 m.

**Port Accommodation.**—Anchorage for steamers in 28 to 36 ft. at low water. Loading and discharging by lighters.

**Trade.**—Exports: cotton, sugar, rice, rubber, manioc, hides, ginger, gum, tapioca, &c., £209,800; imports: textiles, wines, flour, coal, iron, &c., £452,000. B. V.-C.

**Marseilles,** port and coaling station in S. of France. Lat. 43° 18′ N.; long. 5° 22′ E. Pop. 491,200. Distance by sea from London, 2038 m.; Gibraltar, 696 m.; Naples, 456 m.; Port Said, 1506 m.

**Port Accommodation.**—Water area of docks about 500 acres; quayage about 10 m.; depth of water for largest vessels afloat. Six graving docks.



**Steam Communication.**—Orient, and P. and O. from London; Bibby from Liverpool, and other lines.
**Trade.**—Exports: wines, fruits, cork, anchovies, silks, cotton, wool, &c.; imports: grain, coal, oil seeds, raw silk, sugar, hides, &c. Value of trade (1904), £82,400,000.

**Martinique.**—This island colony belonging to France is in 14° 30′ N. and 61° W., and lies 80 miles SE. of Guadeloupe. Area, 381 sq. m. Pop. (1901), 203,781.

**Physical Features.**—Of volcanic origin, the island is traversed from NW. to SE. by a chain of high mountains intersected by valleys and narrow gorges; its highest point is the destructive volcano Montagne Pelée (4430 ft.), which devastated nearly the whole area in 1902.
**Climate.**—Hot and humid; rainy season (December to March), with 69.8° to 82.4° F., and 18.7 in. rain; dry season (April to July), with 71.6° to 87.8° F., and 5½ in. rain.
**Resources and Production.**—The chief crops are sugar-cane, coffee, cocoa, tobacco, and cotton.
**Exports** (1905), £725,460. **Imports**, £596,294. Chief commercial towns and ports: Fort-de-France and St. Pierre.

**Maskat**, port of Oman, on the Gulf of Oman, 5890 m. from London.

**Port Accommodation.**—Anchorage in 5 to 6 fathoms, 2 cables' length from pier.
**Steam Communication.**—British India S.S. Co., British and Colonial, &c.
**Trade.**—Exports: chiefly dates, fish, and limes (1904–5), £148,900; imports: rice, textiles, coffee, sugar, &c., £364,000.

**Massawa**, a fortified port of Eritrea, on Red Sea. Lat. 15° 36′ N.; long. 39° 27′ E. Pop. 8000. Distance from Suez, 957 m.; Aden, 398 m.

**Port Accommodation.**—Anchorage in 5 to 9 fathoms close to town.
**Steam Communication.**—Florio Rubattino from Genoa and Naples.
**Trade.**—Exports: pearls, mother-of-pearl, skins, gold, coffee, horns, &c.; imports: cloth, copper, glass-ware, tobacco, guns and ammunition. B. V.-C.

**Matadi**, port of the Congo Free State, on the left bank of the river, at the head of ocean navigation and at the terminus of the railway to Stanley Pool.

**Steam Communication.**—Woermann line from Hamburg.
**Trade.**—Exports: coffee, cocoa, rubber, palm-oil, ground-nuts, &c.

**Mauritius.**—Area, with Rodriguez, 835 sq. m. Pop. (1905), 382,972.

**Physical Features.**—Coast nearly surrounded by coral reefs and islets; interior a wooded mountainous plateau, above which several mountains rise; highest peak (Piton de la Rivière Noire), 2711 ft.; lake (Grand Bassin), 2188 ft. above sea, whence the various streams take their rise.
**Climate.**—Temperature ranges between 59° and 86° F.; mean at Port Louis, 77° F.; warm season from December to April; mean rainfall, 40 in.; subject to hurricanes and cyclones. The destruction of the forests has injuriously affected the climate.
**Resources and Production.**—The sugar-cane forms the staple product of agriculture, and there is a large export trade in unrefined sugar, rum, and molasses; other products are vanilla, aloe fibres, and cocoa-nuts.
**Shipping and Railways.**—Principal harbour, Port Louis. Vessels entered and cleared (1904), 485 vessels of 813,999 tons. Merchant fleet, 3 steamers of 99 tons and 57 sailing vessels of 5458 tons. Railways, 105 m.
**Exports** (1905), £2,456,000; to U.K., £179,400. **Imports**, £1,796,000; from U.K., £490,500.

**Mazagan**, port on W. coast Morocco. Lat. 33° 16′ N.; long. 8° 26′ W. Pop. 7000. Distance from Tangier, 265 m.; Mogador, 132 m.

**Port Accommodation.**—Open roadstead with anchorage in 6 fathoms. Loading by lighters.
**Steam Communication.**—Forwood line from London.
**Trade.**—Exports: wheat, beans, almonds, oil, wool, hides, skins, bones, lentils, wax, &c. (1904), £323,000; imports: cottons, woollens, tea, sugar, candles, &c., £352,000.

**Mazatlan**, port and coaling station on W. coast Mexico. Lat. 23° 12′ N.; long. 106° 24′ W. Pop. 18,000. Distance from San Francisco, 1344 m.; Acapulco, 587 m.

**Port Accommodation.**—Depth on bar, 12 ft.; anchorage for large vessels, 1½ m. from the pier, dangerous from June to October owing to hurricanes. Discharging by lighters.
**Steam Communication.**—Pacific Mail from San Francisco.
**Trade.**—Exports: gold, silver, dyewoods, orchil, and hides (1904), £382,675; imports: general goods, £351,824. B. V.-C.

**Melbourne**, port and coaling station, Victoria. Lat. 37° 49′ S.; long. 144° 58′ E. Pop. (with suburbs), 501,500. Distance from London *viâ* Suez, 11,220 m.; Sydney, 516 m.; Hobart, 443 m.; Wellington (N.Z.), 1481 m.

**Port Accommodation.**—Berthage, 44,700 ft., with low-water depths from 13 to 28 ft. alongside. Three-fourths of Port Phillip (800 sq. m.) available for anchorage. Two dry docks, admitting vessels of 5000 tons, and graving dock at Williamstown.
**Steam Communication.**—Orient, P. and O., Aberdeen lines from London; N.D.L. from Southampton; M.M. from Marseilles; U.S. Co. from New Zealand ports.
**Trade.**—Exports: wool, gold, wheat, flour, butter, cheese, tallow, frozen and preserved mutton, wine, &c.; imports: general merchandise. Value of trade, £32,585,000.

**Memel**, port and coaling station, NE. Prussia, on Baltic. Lat. 55° 44′ N.; long. 21° 9′ E. Pop. 20,500. Distance from Hull, 914 m.; Danzig, 122 m.

**Port Accommodation.**—Quayage, 2675 ft.; average depth, 19 ft. Two patent slips.
**Trade.**—Exports: timber, grain, flax, hemp, amber, corn, bristles, hides, linseed, wax, pitch, tar, and nails (1904), £1,429,550; imports: colonial produce, salt, herrings, dyewoods, tobacco, coals, &c., £1,391,200. B. V.-C.

**Mersina**, port in S. of Asia Minor. Lat. 36° 58′ N.; long. 34° 37′ E. Pop. 10,000. Distance from Beirut, 194 m.; Alexandretta, 80 m.; Smyrna, 594 m.




**Port Accommodation.**—Open roadstead with anchorage in 5 fathoms. Discharging and loading by lighters.
**Trade.**—Exports: wheat, barley, oats, sesame, wool, chrome ore, &c. (1904), £1,005,000; imports: cottons, yarns, ironware, pottery, tobacco, rice, beans, dates, copper, &c., £765,000. B. V.-C. at Adana.

**Methil**, port of Fife, on Firth of Forth. Lat. 56° 11′ N.; long. 3° 1′ W.

**Port Accommodation.**—Quayage, 4240 ft.; high-water depths, 23 to 28 ft. Two docks, 600 and 700 ft. long respectively, and depths on sill high water ordinary neaps of 19 and 22 ft.
**Trade.**—Exports: coal, coke, &c. (1905), £837,063; imports: flax and hemp, wood, paper-making materials, &c., £290,868.

**Mexico.**—Area, 767,260 sq. m. Pop. 13,608,000.

**Physical Features.**—From the low-lying strip of coast on both sides, the surface rises rapidly to the high mountain ridges enclosing the great central plateau (6000 to 8000 ft.), which is the main feature of the country; the plateau is traversed by the Sierra Madre and other ranges, and contains several volcanoes (Popocatepetl, 19,784 ft.); on the N. it is bounded by the depression of the Rio Gila, and on the S. by that of the Isthmus of Tehuantepec. In the SW. the peninsula of Yucatan has a mean elevation of about 800 ft. The Rio Grande del Norte drains the N. part of the plateau; the rivers of the coast slopes are short and rapid; many of the interior streams drain into salt lakes.
**Climate.**—Coast lands hot and unhealthy; maximum temperature at Mazatlan, 94° F., and 36 in. rain; mean at Tuxpan, 76° F., with 62 in. rain; mean at Colima, 78° F., and 4 in. rain; the temperate zone (4000 to 8000 ft.) is healthy; mean annual of Mexico, 60.8° F.; at Toluca the winter temperature is 50° F. Average annual rainfall on plateau, 25 in.
**Resources and Production.**—Agriculture is still in a primitive condition; in 1903 its chief products were wheat, 5,619,441 cwts.; maize, 88,069,976 bushels; barley, 8,781,330 bushels; beans, 8,812,078 bushels; sugar, 1,964,160 cwts.; henequen, 2,667,966 cwts.; cotton, 721,054 cwts.; coffee, 577,353 cwts.; tobacco, 8,611,713 lbs.; spirits and alcoholic liquors, 108,960,770 gallons. Cattle-rearing is largely carried on; in Mexico in 1902 there were 5,142,457 head of cattle, 859,217 horses, and 3,424,430 sheep, besides pigs, asses, &c.; the total value of live-stock being about £12,052,316. The chief mineral exports in 1905–6 were gold, £3,169,170; silver, £7,560,561; copper, £2,865,590; lead, £496,781; antimony, &c., £198,962.
**Shipping and Railways.**—The principal ports are Acapulco, Tampico, Mazatlan, Vera Cruz, Progreso, and Tehuantepec. The merchant fleet in 1901 comprised 24 steamers of 7957 tons, and 48 sailing vessels of 8761 tons. Length of railways open (1904), 12,209 miles.
**Trade.**—Exports: metals, cabinet woods, hides and skins, henequen, &c. (1905), £24,830,000; imports: iron and steel goods and machinery, building timber, cereals, cotton and cotton goods, &c., £17,564,000. Fully 12½ per cent. of the trade, both exports and imports, is with the United Kingdom.

**Middlesbrough**, a port of Yorkshire, on R. Tees, 8 m. from its mouth. Lat. 54° 34′ N.; long. 1° 6′ W. Pop. 92,000. Distance from Newcastle, 39½ m.; Hull, 99 m.; London, 198 m.

**Port Accommodation.**—Depths from 21½ ft. at lowest neaps to 37 ft. at highest springs. Graving and floating docks, patent slips, and gridiron.
**Trade.**—Exports: iron and steel manufactures, machinery, bricks, clay, coke, coal, chemicals, salt, &c. (1905), £4,682,953; imports: iron and manganese ores, unwrought metals, timber, slates, grain, sugar, &c., £1,750,078.

**Mobile**, port and coaling station, Alabama. Lat. 30° 14′ N.; long. 88° 1′ W. Pop. 38,500. Distance from New Orleans, 204 m.; Havana, 547 m.

**Port Accommodation.**—Depths at lower anchorage (20 m. below city), 30 to 45 ft.; in channel, thence to city, 23 ft. Floating dock, marine railways and slipways.

**Trade.**—Exports: lumber, timber, grain, flour, live-stock, meat, cotton, and vegetables (1905), £4,186,220; imports: salt, coffee, and general merchandise, £1,061,041. B. V.-C.

**Mogador,** a port on W. coast of Morocco. Lat. 31° 50′ N.; long. 9° 20′ W. Pop. 16,000. Distance from London, 1450 m.; Teneriffe, 385 m.

**Port Accommodation.**—Open bay with anchorage in 40 ft.

**Steam Communication.**—Forwood line from London; C.T. from Cadiz.

**Trade.**—Exports: wool, hides, skins, maize, dates, almonds, gums, beeswax, olive oil, &c. (1904), £364,000; imports: textiles, hardware, tea, sugar, candles, glass, earthenware, &c., £325,400. B. V.-C.

**Moji,** port and coaling station, Japan, in N. of Kiushiu. Lat. 34° 58′ N.; long. 131° E.

**Port Accommodation.**—Anchorage in 30 ft. at low-water springs. Loading by lighters.

**Trade.**—Exports: coal, cotton yarn, metals (1904), £1,318,000; imports: provisions, machinery, sugar, petroleum, £1,030,000.

**Mollendo,** a port of Peru. Lat. 17° 1′ S.; long. 72° 2′ W. Pop. 3000. Distance from Callao, 458 m.; Valparaiso, 966 m.

**Port Accommodation.**—Open coast, with anchorage in 20 to 25 fathoms. Loading by lighters.

**Steam Communication.**—Pacific S.N. Co. from Panama.

**Trade.**—Exports: wool, bark, hides, specie, &c. (1904), £477,896 of Peruvian produce, and £354,935 of Bolivian; imports: textiles, provisions, hardware, furniture, wines, &c. B. V.-C.

**Mombasa,** port and coaling station, British E. Africa. Lat. 4° 3′ S.; long. 39° 41′ E.; at starting point of railway to Victoria Nyanza.

**Port Accommodation.**—Harbour well sheltered by coralline bar of depth sufficient for the largest vessels. Two piers. Unloading by lighters.

**Steam Communication.**—B.I.S.N. Co. from London.

**Trade.**—Exports: gum, copra, cattle, grain, ivory, &c. (1904-5), £235,000; imports: cotton goods, metals, provisions, &c., £578,000.

**Monrovia,** capital and port of Liberia, on left bank of Mesurado River, near its mouth.

**Port Accommodation.**—Anchorage a mile from shore in 4 to 7 fathoms; 4 ft. of water on bar at ebb.

**Steam Communication.**—Woermann line from Hamburg.

**Trade.**—Exports: palm-oil, cotton, ivory, camwood; imports: textiles, tobacco, spirits, &c. B. C.

**Montenegro.**—Area, 3630 sq. m. Pop. 227,900.

**Physical Features.**—Surface mountainous, with a barren stony plateau in the centre; narrow coastal strip on the Adriatic, with valleys opening off it; well watered; longest river the Piva (40 m.); E. part covered with forests of beech, oak, and pine; SE. contains part of Lake of Skutari.

**Climate.**—Severe in the highlands, with great extremes of heat and cold (104° F. in summer); mean temperature on coast (Dulcigno), 61° F.; on E. plateaus, 28.5° F.

**Resources and Production.**—Agriculture is in a backward condition; principal crops grown are maize, tobacco, oats, potatoes, barley, and buckwheat; in the coastal strip the vine, olive, mulberry, fig, and almond are cultivated. Lack of roads renders the forests practically valueless. Cattle-rearing is successfully carried on. Among minerals, iron has been found.

**Shipping and Railways.**—Two small steamers of 30 and 40 tons on Lake of Skutari. Narrow-gauge railway, 100 m., in course of construction between Antivari and Nikšićs.

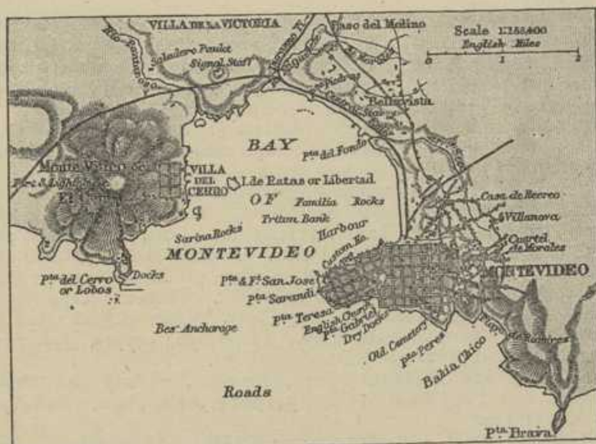
**Exports** (special, 1905), £71,043. **Imports,** £193,255.

**Montevideo,** capital and chief port of Uruguay, in lat. 34° 53′ S., and long. 56° 12′ W.; 6325 m. from London, and 6280 from Liverpool.

**Port Accommodation.**—Open bay, exposed to the strong winds SW. to SE.; anchorage outside southern point in about 23 ft. Cargo discharge by lighters. Moles are under construction for the formation of a port.

**Steam Communication.**—P.S.N., Lamport & Holt, and Houston lines from Liverpool; Houlder line from London; R.M.S.P. from Southampton; A.L. from Trieste.

**Trade.**—Exports: wheat, wool, extract of beef and other animal products; imports: textiles, hardware, coal, groceries, &c. B. C.




**Montreal,** port of Canada, on the St. Lawrence River, 136 m. from Quebec, 864 m. from Belle Isle, and 2760 from Liverpool.

**Port Accommodation.**—Channel up the river from Quebec has a depth of 27½ ft. at low water. Wharfage, with depths alongside of 27½ ft. and over, extends to a length of 6 miles. Harbour closed by ice from beginning of October to end of April.

**Steam Communication.**—Allan and Beaver lines from Liverpool.

**Trade**—Exports: animal and agricultural products, leather and wood manufactures, &c. (1904), £13,943,000; imports, £16,556,000.

**Morocco.**—Area, 220,000 sq. m. Pop. 5,000,000.

**Physical Features.**—Traversed by the lofty Atlas and Anti-Atlas ranges and their foot-hills, the country is divided into two separate regions, the rolling hill lands and plateaus of the N. and W., and the arid and hot land facing the Sahara in the S. and E. Watered by numerous rivers and streams, the chief of which is the Mulya.

**Climate.**—Generally healthy; cold in the mountains; hot in the S.; coast equable; mean temperature at Mogador, 66.93° F. (Feb., 61.7° F.; Aug., 71.24°); mean of Morocco, Tangier, and N. coast, 64.4° F.; tempered by sea breezes; rainfall scanty in S. and W.; considerable in the N. between October and March.

**Resources and Production.**—Agriculture and cattle-rearing are the principal occupations, the crops being wheat, barley, maize, cotton, hemp, &c.; large quantities of olives, figs, almonds, grapes, oranges, lemons, and dates are also grown. Mineral resources great, but undeveloped.

**Shipping.**—Principal ports: Tangier, Laraiche, Mazagan.

**Exports** (1905), £1,040,000. **Imports,** £1,857,300.

**Moulmein,** port and coaling station, Burma, at mouth of Salwin R. Lat. 16° 3′ N.; long. 97° 42′ E. Pop. 58,500. Distance from Colombo, 1276 m.; Calcutta, 934 m.; Rangoon, 147 m.

**Port Accommodation.**—Depth of 3 fathoms in Amherst harbour, 3 m. from shore. Patent slip and slipway.

**Steam Communication.**—B.I.S.N. from London, *viâ* Calcutta.

**Trade.**—Exports: teak, sapan wood, lac, rice, betel-nuts, and ivory; imports: cottons, cocoa-nuts, marine stores, &c.

**Nagasaki,** treaty port and coaling station of Japan, on the island Kiushiu; in lat. 32° 44′ N.; long. 129° 51′ E.; 10,850 m. from London. Pop. 153,300.

**Port Accommodation.**—Anchorage in the inner harbour within the 3 fathom line; depth at entrance, 14 ft. at low water. The outer harbour affords good and well-sheltered anchorage. New works have been partially destroyed by a typhoon.

**Steam Communication.**—P. and O., Shire and Ben lines from London and the N.Y.K. from Southampton.

**Trade.**—Exports: agricultural products, coal, charcoal, &c. (1905), £439,565; to U.K., £4779; imports: cereals, coal, hardware, petroleum, £1,995,859; from U.K., £1,101,359. B. C.

**Nankin,** port of China, on the Yang-tse-kiang, 130 m. from its mouth.

**Port Accommodation.**—Vessels drawing 20 ft. of water can ascend to this port.

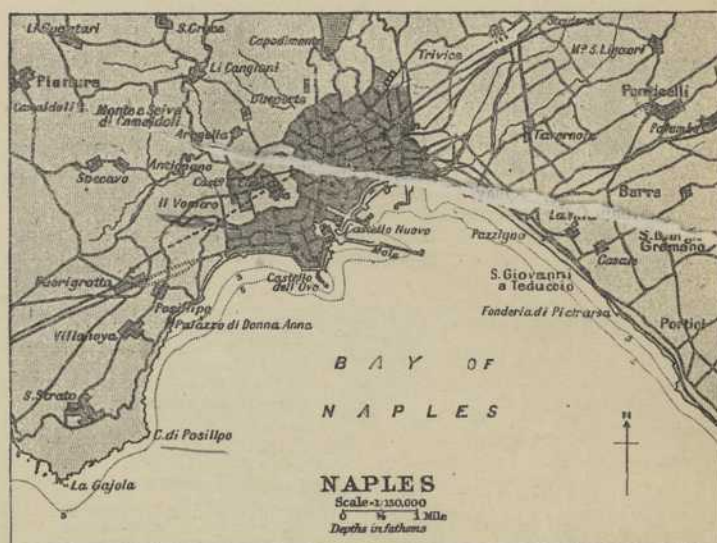
**Trade.**—Exports (1905), £488,000; imports, £1,102,000. B. V.-C.

**Naples,** port and coaling station of Italy, on the west coast; in lat. 40° 50′ 19″ N., and long. 14° 15′ 36″ E.

**Port Accommodation.**—The harbour, sheltered by breakwaters, can receive the largest vessels. There are 3 dry docks, the largest being 659 ft. long.

**Steam Communication.**—Orient, Anchor, D.O.A.L., N.D.L. Cunard (from New York), M.M., Rub. &c.

**Trade.**—Exports: wines, silk, hemp, flax, fruit, &c. (1905), £3,281,714; imports: manufactured goods, colonial produce, coal, iron, &c., £4,365,603. B.C.




**Nassau,** capital and port of the Bahamas, and a coaling station, on New Providence Island.

**Port Accommodation.**—Good anchorage inside and outside harbour. Depth at low water on bar, 17 ft.; in port, 13½ to 18 ft. Ample service of lighters.

**Steam Communication.**—Ward line from New York.

**Natal.**—Area (with Zululand, Vryheid, &c.), 35,371 sq. m. Pop. (1905), 1,141,406.

**Physical Features.**—A fertile coastal strip, about 15 m. broad, is succeeded by a series of elevated terraced lands leading up to the Drakensberg or Kwathlamba Mts.; well watered by numerous rivers.

**Climate.**—Temperature varies with altitude, but the climate is everywhere healthy; average annual rainfall, 42 in.

**Resources and Production.**—Agriculture is the chief occupation, the yield of the principal crops in the year 1905 being: maize, 4,674,972 bus.; wheat, 3741 bus.; barley, 6366 bus.; oats, 9120 bus.; potatoes, 452,193 bus.; sugar (1904), 88,079 cwts. Other crops grown are turnips and vegetables, coffee and tea. Cattle and sheep farming is largely pursued, the numbers of live-stock owned by Europeans in 1905 being 783,887 horned cattle, 769,601 sheep, and 54,637 horses, besides pigs, goats, asses, &c. Valuable coalfields are worked in the N. of the colony, the output for 1905 being 1,129,407 tons. The forests of Zululand supply abundance of timber.

**Shipping and Railways.**—Chief port, Durban, *q.v.* Merchant fleet (1905), 27 vessels of 1740 tons. Tonnage of vessels entered (1905), 2,520,163; of vessels cleared, 2,505,867.

**Exports** (1905), £2,870,482; to U.K., £1,445,144. **Imports** (1905), £10,742,259; from U.K., £6,160,134.

*x*

**Netherlands.**—Area, 12,559 sq. m. Pop. (1905), 5,592,000.

**Physical Features.**—Surface everywhere low and flat; parts in the W. 12 to 20 ft. below sea-level; protected by dams and dykes from the encroachments of the sea; watered by the Rhine, Maas, Scheldt, and other rivers; everywhere intersected by canals.

**Climate.**—Mean annual temperature, 49.8° F. (Jan., 34.7°; July, 65.1°); rainfall, 27.8 in.

**Resources and Production.**—The soil is mainly devoted to agriculture, horticulture, and grazing, dairy farming being extensively carried on; about a fifth of the whole land is unproductive. The principal crops grown are wheat, rye, barley, oats, potatoes, buckwheat, beans, peas, rapeseed, flax, beetroot, tobacco, and madder; there is a large export trade in bulbs, shrubs, and vegetables. Coal is worked in the province of Limburg. About 6000 vessels of all kinds are engaged in the North Sea and Zuider Zee fisheries. The quantity of oysters produced in 1904 was 41,060 cwts.

**Shipping and Railways.**—Principal ports are Amsterdam, Flushing, Harlingen, and Rotterdam. Merchant fleet (1906), 27 steamers of 1,009,700 cubic mètres, and 479 sailing vessels of 154,365 cubic mètres. Vessels entered (1905), 13,209 of 33,229,402 cubic mètres; cleared, 13,298 of 33,156,138 cubic mètres.

**Exports** (special, 1905), £166,150,000; to U.K., £34,140,000. **Imports**, £215,300,000; from U.K., £21,990,000.

**Nevis (Charlestown),** British West Indies; in lat. 17° 10′ N., and long. 62° 35′ W.

**Port Accommodation.**—Good anchorage in 5 fathoms. Cargo discharged by lighters.

**Steam Communication.**—Royal Mail Steam Packet Co. from Barbados.

**Trade.**—Exports: sugar, cotton, tamarinds; imports: provisions.

**New Caledonia.**—Area, with dependencies, 7650 sq. m. Pop. 52,000.

**Physical Features.**—Coast surrounded by coral reefs; interior mountainous, intersected by broad valleys, with a broad plateau towards the centre; well watered; principal river, the Dihon (50 m.), in the N.; much of the N. under forests; in the S. the soil is more arid.

**Climate.**—Tropical, but healthy, being tempered by sea breezes. Temperature varies between 55.4° and 98.8° F. Rainfall, 48 in. at Nouméa, and 63 in. on NE. coast.

**Resources and Production.**—Agriculture, grazing, and mining are the principal occupations; among agricultural products are coffee, maize, tobacco, sugar, grapes, manioc, pine-apples, vegetables, sweet potatoes, cotton, and vanilla. The principal minerals worked are nickel (123,275 tons in 1905), cobalt, chrome, and copper ores; coal has also been found.

**Shipping and Railways.**—Principal port, Nouméa, where vessels drawing 21 ft. can discharge at a wharf. Vessels entered (1904), 133 of 173,357 tons; cleared, 137 vessels of 170,760 tons. Railway, 90 m., under construction from Nouméa to Bourail. M.M. from Marseilles.

**Exports** (1905), £442,800. **Imports**, £429,080, nearly 80 per cent from Australia.

**Newcastle,** port of New South Wales; in lat. 32° 55′ 15″ S., and long. 151° 49′ 15″ E.; 62 m. by sea N. of Sydney.

**Port Accommodation.**—Quayage, 3490 ft., and 660 ft. at Stockton Wharf at Dyke, 5550 ft.; and smaller wharves. Depth at entrance, 20 ft. at low-water springs. Patent slip; graving dock to be constructed.

**Trade.**—Exports: coal, wool, and frozen meat. Value of trade (1903), £3,193,786.

**Newcastle-on-Tyne,** port and coaling station near the mouth of the Tyne, Northumberland; lat. 55° 1′ N., and long. 1° 25′ W.

**Port Accommodation.**—Depth on bar [illegible] ft. at low-water spring tides. Several docks with [illegible] sills down to 24½ ft.; patent slips, dry docks, &c. [illegible] also at North and South Shields.

**St[illegible] Communication.**—United S.S. Co. of Copenhagen.

**Trade.**—Exports: coal, chemicals, manufactured iron, &c. (1905), £7,903,066; imports: grain, colonial produce, ore, timber, &c., £9,154,268.




**Newfoundland.**—Area (with Labrador), 162,734 sq. m. Pop. 229,529. Island in the Gulf of St. Lawrence and a British Colony.

**Physical Features.**—The coast is much indented, and the surface rugged and mountainous in the W., but low in the E. Parts are covered with spruce and pine forests and scrub. In the interior there are many lakes; the chief rivers are the Exploits and the Gander. The Labrador coast is bleak and inhospitable, and but sparsely populated.

**Climate.**—Milder than in Canada; everywhere healthy; subject to fogs on the S. coast. Mean annual rainfall, 38 in.

**Resources and Production.**—The fisheries form the main resource of the colony, the annual value of fish caught being upwards of £1,000,000. Cultivated land (1901), 85,533 acres, under potatoes, turnips, hay, barley, oats, &c. Minerals worked are copper and iron; coal, gold, silver, and lead ores are also found.

**Shipping and Railways.**—The chief port is St. John's. The merchant fleet in 1904 comprised 65 steamers of 11,597 tons, and 2880 sailing vessels of 113,909 tons. Total tonnage of vessels entered and cleared (1904), 1,631,145, of which 1,047,992 were British. Railways open (1903), 659 m. Coastal communication maintained by 8 steamers.

**Trade.**—Exports: fish, fish oils, sealskins, iron and copper ores, &c. (1905), £2,193,143; to U.K., £389,972; imports: £2,112,966; from U.K., £545,731.

**New Guinea.**—Area, 312,000 sq. m. (of which 90,540 sq. m. is British, the remainder belonging to the Netherlands and Germany). Pop. estimated at 2,500,000 (Brit. New Guinea, 350,000).

**Physical Features.**—The S. coast is bold and rocky, the N. mountainous; the whole of the interior is mountainous and covered with dense forests, spreading here and there into wide alluvial plains formed by the silt of the rivers flowing through it; country but little explored. Chief rivers, the Fly and Kaisirin Augusta.

**Climate.**—Unhealthy and fever-haunted during rainy season (Jan., Feb., March); highest temperature at Port Moresby, 89.7° F. in Jan.; lowest at Sogeri (25 m. inland), 62.6° F. in July; rainfall, 40.653 in.

**Resources and Production.**—Bananas, sago, sugar-cane, tamarinds, cocoa-nuts, bamboo, cotton, camphor trees, indiarubber, and tobacco are cultivated; the timber of the forests includes sandalwood, ebony, cedars, oaks, pines, and other valuable woods. Gold mining is carried on to some extent, and there are pearl and sponge fisheries off the coast.

**Shipping.**—Chief port of British New Guinea, Port Moresby; of German New Guinea, Friedrich Wilhelmshafen.

**Exports** of British New Guinea (1905), £76,345; of German New Guinea (1904), £2714. **Imports** of British New Guinea, £67,188; of German New Guinea, £31,038.

**Newhaven,** port in Sussex, at the mouth of the Ouse; in lat. 50° 46′ 55″ N., and long. 0° 3′ 40″ E.; 62 m. from Southampton.

**Port Accommodation.**—Depth at entrance, 26 ft. at high-water ordinary neaps. Quayage, 4740 ft., accessible to vessels drawing 22 to 28 ft.

**Steam Communication.**—London, B. and S. Coast Ry.'s steamers to Dieppe.

**Trade.**—Exports: silk and woollen goods, leather, &c. (1905), £3,042,000; imports: silk and woollen goods, metals, fish, motors, £12,664,000.

**New Orleans,** the chief port and coaling station of the Gulf States of America, about 112 m. from the mouth of the Mississippi; in lat. 29° 58′ N., and long. 90° 5′ W.

**Port Accommodation.**—Depth at entrance to port, 26 to 27 ft.; alongside wharves, 20 to 30 ft. The wharves extend in a continuous line for 7 miles.

**Steam Communication.**—Prince line from London, and West India and Pacific from Liverpool, and Leyland line from London and Liverpool.

**Trade.**—Exports: cotton, grain, timber, tobacco, &c. (1905), £28,870,401; imports: coffee, sugar, fruits, fibres, £7,116,022. B. C.




**Newport,** port and coaling station in Monmouthshire, at the mouth of the Usk; in lat. 57° 30′ N., and long. 3° W.

**Port Accommodation.**—Depth at entrance to port, 30 ft. at high tide ordinary neaps. Several docks with depth on sill at neap tide of 25 ft.

**Trade.**—Exports: coal, coke, iron goods, tin-plates, &c. (1905), £3,411,794; imports: iron ore and pig-iron, timber, grain, &c., £1,771,049.

**New South Wales.**—Area, 310,700 sq. m. Pop. (1901), 1,359,200.

**Physical Features.**—Coast generally bold and rocky; the surface consists of the undulating coast lands, from 35 to 120 m. wide, stretching back to the Great Dividing Range, forming the watershed of the state; an elevated plateau intersected by precipitous valleys; and in the W. the fertile lands sloping to the great central plain; well watered by numerous rivers.

**Climate.**—Salubrious; mean temperature at Sydney, 63° F. (Feb., 98.1°; June, 38.4°); rainfall, 38.619 in.; temperature on the inland plains sometimes rises to 130° F., with a very scant rainfall.

**Resources and Production.**—Agriculture, sheep farming, mining, and manufactures are the principal occupations. The chief crops in 1905 were: wheat, 20,996,000 bus.; barley, 111,266 bus.; oats, 883,081 bus.; maize, 5,539,750 bus.; potatoes, 49,503 tons. Tobacco and sugar-cane are also cultivated, and 831,700 gals. of wine were produced in 1905; the wool crop of 1905-6 was more than 805,000 bales. There are 2,274,386 head of cattle and 42,722,320 sheep in the colony. Value of gold raised (1905), £1,165,013; silver, silver-lead, &c., £2,441,856; copper, £511,754; tin, £173,806; coal (6,632,138 tons), £2,003,461.

**Shipping and Railways.**—Principal ports, Sydney and Newcastle. Vessels entered and cleared (1905), 5419 of 9,381,619 tons. Railways open (1906), 3471 m.

**Exports** (1905), £24,493,530; to U.K., £10,222,422. **Imports**, £14,492,123; from U.K., £8,601,588. Inter-state trade is excluded.

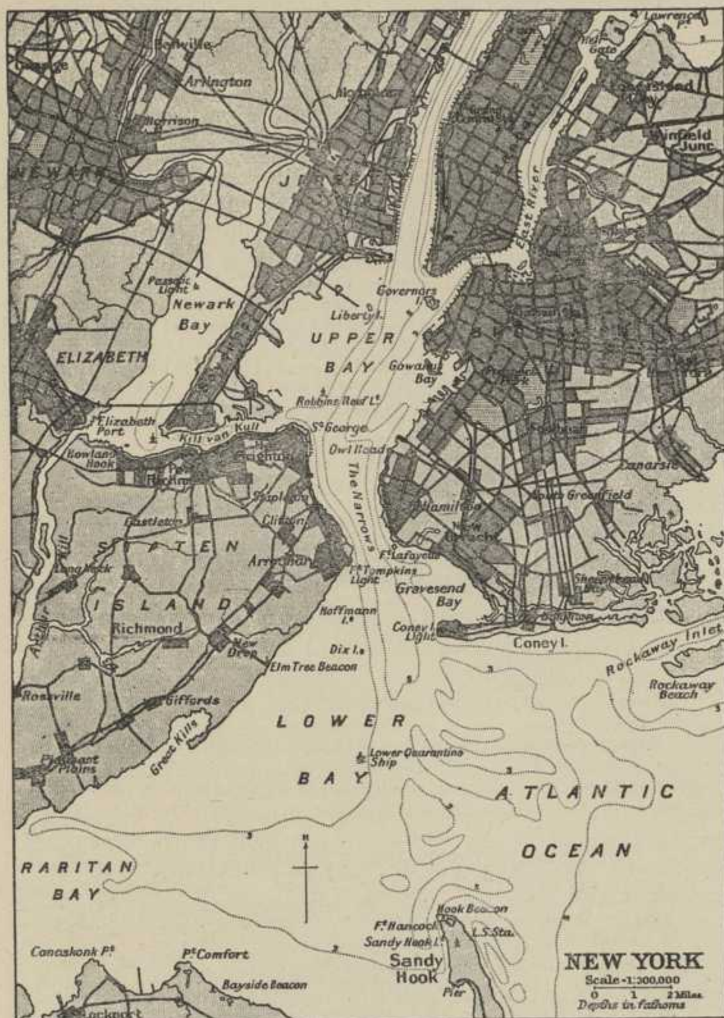
**New York,** capital and chief port of the United States, and a coaling station; in lat. 40° 42′ N., and long. 74° W.; 3050 m. from Liverpool.

**Port Accommodation.**—Depth on bar at Sandy Hook, 35 ft. at high water and 29½ at low. Every accommodation for the largest vessels at the North River piers at all states of the tide, and for smaller vessels in the East River. Many dry docks of various kinds, marine railways, &c.

**Steam Communication.**—Cunard and White Star lines from Liverpool, Anchor from Glasgow, Am. from Southampton, N.D.L. from Bremen,

Atlantic Transport from London, C.G.T. from Havre, Red Star from Antwerp, &c.

**Trade.**—Exports: bread-stuffs, meat, cotton, petroleum, tobacco, &c. (1905), £109,185,000; to U.K., £30,195,000; imports: wool, sugar, silk, coffee, &c., £142,560,000; from U.K., £23,457,000.




**New Zealand.**—Area, 104,750 sq. m. Pop. (1901), 816,000.

**Physical Features.**—Surface mountainous, intersected by broad valleys and well-watered plains, the N. Island being actively volcanic, with numerous hot geysers and lakes; coast line rugged; rivers numerous, but few navigable; highest peak, Mt. Cook, 12,350 ft.

**Climate.**—Everywhere salubrious; temperature varies with latitude and altitude; mean temperature of spring, 55°; summer, 63°; autumn, 57°; and winter, 48° F.; nights about 12° colder than the days; rainfall abundant.

**Resources and Production.**—Agriculture, cattle-rearing, sheep and dairy farming, and mining are the chief occupations. The chief crops in 1905 were wheat, 6,798,934 bus.; barley, 1,024,045 bus.; oats, 12,707,982 bus.; maize, 633,212 bus.; potatoes, 123,402 tons; of wool, 139,912,737 lbs. were exported. The number of cattle is 1,810,936, and of sheep 19,130,875. There is a large meat freezing and preserving industry, the value of the meat of all kinds exported in 1905 being £2,775,000; and large quantities of butter and cheese are exported. Value of the principal minerals (1905): gold, £2,093,936; silver, £120,542; coal (1,585,756 tons), £792,878.

**Shipping and Railways.**—Chief ports, Auckland, Wellington, Lyttelton, Bluff Harbour, and Dunedin. Vessels entered (1905), 627 of 1,139,410 tons; cleared, 627 vessels of 1,141,552 tons. Length of railways open (1906), 2520 m.

**Exports** (1905), £15,655,947; to U.K., £12,087,818. **Imports** (1905), £12,828,857; from U.K., £7,795,284. Trade (1906), £33,375,000.

**Nicaragua.**—A republic of Central America. Area, 49,550 sq. m. Pop. 430,000.

**Physical Features.**—The Cordillera runs along the SW. side; in the deep depression between the mountains and the sea lie Lakes Managua and Nicaragua; in the E. an extensive plain stretches to the Caribbean Sea; the N. is composed of terrace-lands, occupying about two-thirds of the surface. The principal rivers flow eastward to the Caribbean Sea; they are the San Juan, draining L. Nicaragua, the Blewfields, Grande, and the Coco or Wanks.

**Climate.**—Temperature varies with altitude; at Matagalpa (3300 ft.) the mean is 66.2° F.; the general variation is from 70° to 90°. Rainfall greatest on E. coast.

**Resources and Production.**—Agricultural products are coffee, of which over 28 million lbs. were exported in 1903; bananas; sugar, with an export of over 7734 cwts., a large part being consumed in the country or used in the manufacture of spirit; cocoa, chiefly consumed at home; rubber; tobacco; maize; mahogany, and rice. Mining is also carried on; the output of gold in 1903 was valued at £114,366.

**Shipping and Railways.**—The principal ports are Blewfields, Corinto, and Greytown. Merchant fleet (1905), 2 steamers of 420 tons, and 12 sailing vessels of 7607 tons. Vessels entered (1904), 2192, of 541,513 tons; cleared, 2108, of 533,597 tons. Railways, 171 miles.

**Exports** (1904), £785,184; to Gt. Britain, £97,972. **Imports**, £640,452; from Gt. Britain, £81,041.

**Niuchwang,** port of Manchuria, on the Liao River, 25 m. from its mouth; in lat. 40° 35′ 26″ N., and long. 121° 58′ 24″ E.

**Port Accommodation.**—Depth on bar at high water ordinary springs, 15 to 22 ft. Safe anchorage in the river in depths of 30 to 60 ft. for a distance of 3 miles. Vessels unloaded at the jetties or by boats.

**Trade.**—Exports: beans and bean-cake, castor-oil, tobacco, silk, &c. (1905), £1,845,000; imports: sugar, cotton and cotton goods, iron, kerosene, &c., £7,514,000.

**Northern Nigeria.**—A British territory in West Africa in the basins of the Niger and Benue rivers and Lake Tsad, comprising the native kingdoms of Sokoto, Kano, Bornu, &c. Area, about 258,000 sq. m. Pop., over 9,000,000.

**Physical Features.**—Much of the country is undulating, dry, and fairly healthy, but malaria is prevalent in the low lands along the rivers. The death-rate among Europeans was 40.37 per thousand in 1904. The rainfall was 33.77 in. at Yola and 57.1 at Zungeru.

**Resources and Production.**—Palm oil and kernels are the products of the low country; rubber, ground-nuts, ivory, hides, kola-nuts, gum, &c., of the inland regions. Cotton-growing has a promising future. Iron ore, galena, tin, and monazite sand occur.

**Transport.**—The government flotilla consists of a twin-screw steamer, 5 stern-wheelers, 16 steam canoes, and a pinnace. A light railway runs from Zungeru to Barijuko (22 m.), and Baro on the Niger will probably soon be connected with Kano.

**Trade.**—Exports (1904), £152,822; imports, £144,713. There is also a caravan trade with Tripoli.

**Norway.**—Area, 124,090 sq. m. Pop. (1905), 2,311,000.

**Physical Features.**—Extensive coast-line, fringed by innumerable islands, and much indented with narrow fjords; interior mountainous, with lofty barren tablelands, separated by deep narrow valleys; numerous lakes, rivers, and mountain torrents, with magnificent waterfalls.

**Climate.**—Tempered by the Gulf Stream; mean annual temperature at Bergen, 44.6° F.; at Trondhjem, 42.8° F.; mean summer temperature at Christiania, 63.5° F.; mean winter at Röraas, 11.3° F. Average rainfall on W. coast, 40 to 75 in.; in interior, 12 to 16 in.

**Resources and Production.**—Only 3 per cent. of the total area is under cultivation, and 22 per cent. under forests, the remaining 75 per cent. being unproductive. The principal crops grown are oats, rye, barley, and potatoes, the yield being insufficient for home requirements. Value of timber exported in 1905, £1,931,033; of wood pulp and cellulose, £1,915,645. The mining industry is comparatively unimportant; the chief minerals worked are silver, copper ore, pyrites, iron ore, apatite, and felspar. The cod, herring, mackerel, salmon, sea-trout, lobster, and oyster fisheries off the coast are valuable, as well as the whale, walrus, seal, and shark fisheries in the northern seas; total value (1905), £2,600,000.

**Shipping and Railways.**—Principal ports are Bergen, Christiania, Christiansand, Drontheim, Hammerfest, Stavanger, and Tromsö. Merchant fleet (1905), 1499 steamers of 676,852 tons, and 5770 sailing vessels of 809,650 tons. Vessels entered (1905), 12,120, of 4,048,051 tons; cleared, 13,494, of 4,117,637 tons. Length of railways open (1905), 1590 m.

**Exports** (1905), £12,100,000. **Imports**, £17,400,000.

**Nouméa.** *See* **New Caledonia.**

**Novorossisk,** Russian port on the Caucasian shore of the Black Sea; 3550 m. from London, and 400 m. from Odessa.

**Port Accommodation.**—The area of the port is about 1¼ sq. m. There are 5 jetties of the Novorossisk-Vladikavkaz Railway, with depths at end of 23½ to 27 ft.

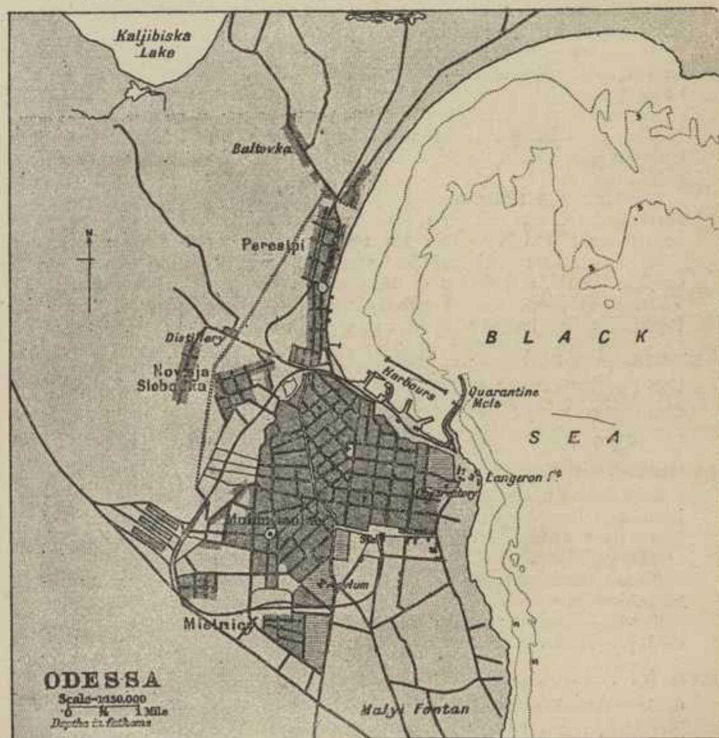
**Trade.**—Exports: grain, oil-seeds, petroleum, and wool.

**Odessa,** chief port of Russia on the Black Sea, and a coaling station; in lat. 46° 22′ N., and long. 30° 44′ E.; 3457 m. from London.

**Port Accommodation.**—Four harbours sheltered by breakwaters. Depth at entrance, 32½ ft. The quarantine and new harbours have quayage 6160 and 3345 ft. respectively, with depths of 26 to 30 ft. The petroleum harbour, sheltered by a separate breakwater, has a mole, of which 900 ft. are available for vessels with a depth of 22 ft.

**Steam Communication.**—Rubattino from Genoa; Papayanni from Liverpool.

**Trade.**—Exports: grain, cattle, linseed, hides, and tallow; imports: coal, iron, machinery, tea, coffee, &c.




**Oman.**—Area, 82,000 sq. m. Pop. 1,500,000.

**Physical Features.**—Surface consists of mountain ranges, plateau, plain, and desert, interspersed with oases; much of the soil is extremely fertile.

**Climate.**—Extremely hot, with tropical rains in December and January. Summer temperature at Maskat rises to 104° F. Cooler on the plateau.

**Resources and Production.**—The principal products are dates, of which large quantities are exported, wheat, barley, maize, indigo, tropical fruits, and vegetables. Copper and salt are the only minerals worked. Considerable fisheries off the coast. For trade *see* **Maskat**.

**Oporto.** *See* **Leixões.**

**Oran,** port and coaling station in Algeria; in lat. 35° 44′ N., and long. 0° 38′ W.; 1565 m. from London; 1525 from Liverpool, and 535 from Marseilles.

**Port Accommodation.**—Harbour of 75 acres, with depth at entrance of 39 to 45 ft. 6440 ft. of quayage, with depth alongside 16½ to 25 ft.
**Trade.**—Exports: grain, cotton, wool, esparto, wine; imports: petroleum, cotton goods, coal. B. V.-C.

**Orange River Colony.**—Area, 50,392 sq. m. Pop. (1904), 387,315.

**Physical Features.**—Surface mostly plateau from 3000 to 5000 ft. above the sea, dotted here and there by isolated kopjes, and with hill ranges along the SE. border; chief rivers are the Vaal, Orange, Modder, and Caledon, mostly running in deep beds below the general level of the country.
**Climate.**—Healthy, but hot in the centre in summer (105° F.); cooler in the E.; summer mean, 77° F.; winter mean, 46° F.; rainfall, 24 in.
**Resources and Production.**—The undulating plains are well adapted for agriculture, and afford excellent grazing for cattle, sheep, and goats. In 1905 the crops included 468,253 bushels of wheat, 186,870 of oats, 863,029 of maize, and 650,000 lbs. of tobacco. Great irrigation schemes are in process of realisation. Live-stock (1905), cattle, 525,372; horses, 93,984; sheep, 4,194,247. Diamond mining is carried on, the output in 1903-4 being 259,900 carats—value, £779,792. Of coal, 47,925 tons were raised in 1905.
**Railways.**—Total length of lines in operation, 1685 m. (1905).
**Exports** (1905), £2,263,925. **Imports**, £3,251,098.

**Ostend,** port and coaling station of Belgium; in lat. 51° 14′ N., and long. 2° 55′ E.; 120 m. from London, and 60 from Dover.

**Port Accommodation.**—Tidal harbour with 1148 ft. of quayage, two docks, with depth of 18 ft. and 2164 and 1574 ft. respectively of quayage. A new deep-water quay has a length of 2800 ft., with depth alongside of 27 ft. at low water.
**Steam Communication.**—Royal Belgian mail steamers from Dover, and in summer New Palace steamers from Tilbury.
**Trade.**—Exports: corn, seed, cattle, potatoes, flax, &c.; imports: coal, colonial produce, manufactured goods. B. V.-C.

**Padang,** port of Sumatra, on the west coast; in lat. 0° 48′ S., and long. 100° 20′ E.; 4713 m. from Suez.

**Port Accommodation.**—Bar has only 10 ft. of water at high tide. Vessels anchor in 6 fathoms between Padang I. and the mainland.
**Steam Communication.**—Koninglijke Paketvaart Maatschappij from Batavia; Ned. S. from Southampton.
**Trade.**—Exports: coffee, spices, rattans.

**Palermo,** chief port of Sicily and a coaling station; in lat. 38° 8′ N., and long. 13° 22′ E.; 2240 m. from London, and 169 from Naples.

**Port Accommodation.**—Two basins of areas 102 and 42 acres respectively, and depths 24 to 39 ft. Lengths of moles used for quays, 2485 and 1755 ft., with depths alongside of 10 to 19½ ft. New dock will shortly be opened.
**Steam Communication.**—Anchor line from Glasgow and Genoa; Cunard line from Liverpool.
**Trade.**—Exports: oil, wine, fruit, sulphur (470,341 tons in 1905); imports: woollen and cotton goods, colonial produce, coal, &c. B. C.

**Panamá.**—A republic of Central America, formerly a department of Columbia. Area, 31,570 sq. m. Pop. 340,000.

**Physical Features.**—A continuous chain of mountains, pierced by several passes, traverses the whole isthmus from Chiriqui to Malli and Pirri. Dense forests of good timber cover the N. slopes of the Cordilleras, and in the S. there are extensive savannahs; the soil is of great fertility, and yields a luxuriant growth of tropical vegetation. The coast is indented by many fine bays, sheltered by islands and coral reefs.
**Resources and Production.**—Only a comparatively small part of the land is under cultivation. The most important products of the soil are the banana, of which about 2½ million bunches are annually exported, caoutchouc, coffee, cocoa, coco-nuts, mahogany, &c. There are pearl fisheries in the Gulf of Panamá and a trade in turtle shell. In the provinces of Chiriqui, Los Santos, Coclé, and Veraguas stock-raising is pursued. Some gold is mined.
**Shipping and Railways.**—In 1905 the number of steam vessels which entered Colon was 471, of 1,361,150 tons; and of sailing vessels 268, of 22,348 tons. On November 18, 1903, a treaty was signed between the governments of the United States and Panamá, granting to the former facilities for the completion of the inter-oceanic canal across the isthmus. There is only one line of railway, that between the ports of Colon and Panamá, with a length of 47 m. and a gauge of 4 ft. 8½ in.

**Panama,** port and coaling station in the Republic of Panama, on the Pacific coast; in lat. 8° 57′ N., and long. 79° 31′ W. It is connected with Colon, on the Atlantic side of the isthmus, by a railway 47 m. long. Distant from San Francisco 3277 m., and from Sydney 7692 m.

**Port Accommodation.**—Anchorage for vessels of all sizes at Flamenco island and Port Ancon, which are included in the zone ceded to the United States for the purposes of the canal. The Pacific Mail Co. has a gridiron at Taboga island.
**Steam Communication.**—P.M. from San Francisco; P.S.N. and Cia. Sud-Americana de Vapores from Panama to western ports of S. America.
**Trade.**—Exports: pearls, mother-of-pearl, rubber, mahogany; imports: coal, provisions, general merchandise. B. C.

**Para** (or Belem), port and coaling station of Brazil in the estuary of the Amazons River; in lat. 1° 30′ S., and long. 48° 23′ W.; 4198 m. from Liverpool.

**Port Accommodation.**—Depth at entrance at high water ordinary neaps, 28 ft.; in harbour at low water ordinary springs, 22 ft. In the port proper, in front of the town, no steamer drawing 18 ft. or over can lie. Quayage, half a mile, with seventeen piers.
**Steam Communication.**—Booth line from Liverpool.
**Trade.**—Exports: rubber, nuts, cocoa, sugar, &c. (1904), £4,708,000; imports: manufactured articles, cotton, timber, provisions, £2,725,000. B. C.

**Paraguay.**—A republic in the interior of South America. Area, 171,204 sq. m. Pop. (1899), 533,299.

**Physical Features.**—The country in general is rolling grassy plain, rising here and there into wooded hills, which nowhere exceed 1500 ft. in height. The Chaco in the W. is covered with dense forests, and has rich pasture lands. The main rivers are the Paraguay, with its affluent, the Paraná, the Pilwmayo, the Apa, and its tributary, the Estrella.
**Climate.**—Dry and warm. Winter lasts from May to August, and summer during the other months of the year. The mean temperature varies in summer from 82.4° to 86°, but at the hottest season may rise to 100° F. The air is tempered by frequent storms from the S. Rainfall, 38.74 in. in summer, and 23.228 in. in winter.
**Resources and Production.**—The immense forests yield valuable timber for construction and cabinet-work; one of the most important being the quebracho used for railway sleepers and for the tannin it contains. Yerba maté, or Paraguay tea, is one of the principal crops. Maize, manioc, tobacco, beans, oranges, and other fruits are also cultivated. Cattle-raising is largely pursued, the estimated number of horned cattle in 1900 being 2,743,665; horses, 182,790; mules and asses, 7626; sheep, 214,060; goats, 32,334; and pigs, 23,900. Little has been done to develop the mining industry, but iron is found in the S. and marble in the N., and pyrites, copper, and kaolin are also met with.
**Shipping and Railways.**—Regular steamers ascend the Paraguay to Asuncion; in 1905, 460 steamers, with a total tonnage of 109,933, entered the port. Length of railways open, 154 m.
**Exports and Imports.**—The chief exports in 1905 were: hides, £354,598; Yerba maté, £138,886; wood, £236,892; tobacco, £109,830. Total exports (1905), £1,046,554; imports, £935,703, fully 30 per cent. from the United Kingdom.

**Paranagua,** port of Brazil, in the state of Parana; in lat. 25° 30′ 57″ S., and long. 48° 19′ 29″ W.

**Port Accommodation.**—Depth on bar at low water, 16 ft. Railway wharf, with facilities for discharging.
**Trade.**—Exports: Paraguay tea (Herva matte), &c., £336,000 (1904); imports: textiles, machinery, provisions, £199,000. B. V.-C.

**Patras,** port of Greece on the north coast of the Morea; in lat. 38° 14′ 47″ N., and long. 21° 44′ 47″ E.; 2660 m. from London, and 376 from Malta.

**Port Accommodation.**—Harbour for vessels drawing up to 22 ft. Loading by lighters.
**Steam Communication.**—Rub. line from Brindisi; Cunard, Papayanni, and Ellerman lines from Liverpool.
**Trade.**—Exports: currants, olive oil, wine, &c.; imports: woollen and cotton goods, grain, sugar, timber, coffee, &c. B. C.

**Payta,** port and coaling station in northern Peru; in lat. 5° 5′ 36″ S., and long. 81° 5′ 30″ W.; 549 m. from Callao.

**Port Accommodation.**—Good anchorage in 30 to 36 ft. of water.
**Steam Communication.**—Pacific S. Nav. Co. and Cia. Sud-Americana de Vapores joint service from Panama.
**Trade.**—Exports: cotton, hides, Panama hats, &c. B. V.-C.

**Penang,** port and coaling station of the Straits Settlements; in lat. 5° 24′ 30″ N., and long. 100° 21′ E.; 8060 m. from London, and 1350 from Calcutta.

**Port Accommodation.**—5000 feet of quayage, with depth alongside at high water of 7 to 9 ft. A new quay, 600 ft. long, has a depth of 30 ft. Dock, 345 ft. long, with patent slip.
**Steam Communication.**—P. and O., B.I.S.N., and Glen line from London; Natal line from Cape Town.
**Trade.**—Exports: spices, tapioca, gutta-percha, and rubber (1905), £7,816,000, sago, tin, &c.; imports: clothing, rice, flour, &c., £9,100,000.

**Pernambuco** (Recife), port and coaling station in Brazil; in lat. 8° 4′ S., and long. 52° W.; 4089 m. from Liverpool.

**Port Accommodation.**—Depth on bar at low water ordinary springs, 24 ft., and on sandbank, 14 to 16; good anchorage.
**Steam Communication.**—P.S.N. from Liverpool, and R.M.S.P. from Southampton.
**Trade.**—Exports: cotton, sugar, carnauba wax, hides, and skins, &c. (1905), £2,553,056; imports; clothing, hardware, flour, &c., £2,677,350. B. C.

**Persia.**—Area, 630,000 sq. m. Pop. 9,500,000.

**Physical Features.**—Surface mostly an undulating, elevated, and treeless plateau, girdled by lofty mountain ranges, with a great salt desert in the central and eastern part. Highest peak, Demavend, 19,400 ft. Rivers, with the exception of the Karun, mostly short, those of the interior losing themselves in salt marshes.
**Climate.**—Unhealthy on Persian Gulf and Caspian coasts. Subject to extremes of heat in summer and cold in winter, and great range of diurnal temperature. Rainfall chiefly in the mountainous parts; very scanty over the plateau.
**Resources and Production.**—In the cultivated area, wheat, barley, rice, and fruits are grown, while silk is cultivated SW. of the Caspian; opium is grown, and exported to Europe and China to the value of £297,000; tobacco and cotton are also grown, while the tea plant has been introduced. Wool, gums, and carpets are largely exported, and a considerable trade is done in pearls. Want of good roads has prevented the exploitation of the minerals, which include lead, copper, tin, iron, zinc, manganese, borax, iron ochre, coal, salt, sulphur, orpiment, alum, naphtha, &c.
**Shipping and Railways.**—Principal ports, Bunder Abbas, Bushire, and Lingah. Vessels entered (1904-5), 1957, of 760,949 tons. Railway (Teheran to Shah Abdul-azim), 6 m.
**Exports** (1904-5), £4,463,000. **Imports** (1904-5), £6,298,000.

**Peru.**—A republic on the W. coast of South America. Area, 695,743 sq. m. Pop. 4,609,000 (?)

**Physical Features.**—The country is traversed by parallel chains of the Andes at some distance inland, with fertile valleys and tablelands spread out among them. Owing to the very meagre rainfall the coastal strip is a succession of sandy deserts, crossed by transverse fertile valleys. Between the Rio Ucayali and the frontier of Brazil there stretches a region of forest-land and pampas, with a tropical and humid climate. The rivers of the coast slope are few, and of little importance, many of them being practically dry during a great part of the year; those on the E. slope of the Cordillera belong to the basin of the Amazon; the principal are the Marañon and the Ucayali. In the S. is the large inland lake Titicaca.
**Climate.**—On the coast the temperature ranges from 60° to 80° F.; mean annual at Lima, 68°; on the tablelands from 40° to 60°; the mean at Cuzco is 59°, and at Cerro de Pasco, 40°. The moist SE. trade-

winds are arrested on the E. slopes of the Andes, where there is a copious rainfall; in the coast region rain seldom falls, but fog is prevalent.

**Resources and Production.**—Agriculture has been greatly hindered by the want of labour, suitable means of transport, and a meagre rainfall; irrigation works now in progress have given an impetus to the growth of cotton, coffee, sugar, &c. About 37,580 cwts. of cotton were produced in 1905. Rice, wheat, maize, tobacco, ramie, and olives are also grown. The E. region yields large quantities of rubber, which is shipped down the Amazon from Iquitos—(1903) 2075 tons. Much valuable timber, dyewoods, cinchona, and other medicinal plants are exported. Stock-raising is pursued in Piura, Cajamarca, Junin, Cuzco, and Lima. The mineral production in 1905 was of the value of £1,636,179, the chief items being silver, £648,000; copper, £622,268; petroleum, £124,250; coal, £98,300; and gold, £97,072. The net receipts of the Peruvian Corporation for guano in 1903-4 was £176,776.

**Shipping and Railways.**—The principal ports of Peru are Callao, Mollendo, Payta, Salaverry, and the river-port Iquitos. In 1905 the merchant fleet consisted of 4 steamers of 5283 tons net, and 35 sailing vessels of 25,039 tons. 531 vessels, of 903,189 tons, entered the port of Callao; and 528 vessels, of 901,108 tons, cleared. The length of railways in 1905 was 1198 m.

**Trade.**—Exports: sugar, minerals, cotton, wool, &c. (1905), £5,751,621; to British Empire, £1,377,993; imports: £4,329,151; from British Empire, £864,923.

**Philadelphia,** port and coaling station in the United States, on the right bank of the Delaware River, 96 m. from the sea; in lat. 39° 57′ N., and long. 75° 10′ W. It is distant from Liverpool 3202 m.

**Port Accommodation.**—Channel along the river front 30 ft. deep. Three dry docks and patent slips.

**Steam Communication.**—American line from Liverpool and Southampton; Allan line from Liverpool; Red Star line from Antwerp and Dover.

**Trade.**—Exports: cattle, grain, petroleum, cotton, tobacco, &c., £14,615,000 (1905); imports: general merchandise, £14,003,000. B. C.




**Philippeville,** port of Algeria; in lat. 36° 53′ N., and long. 6° 54′ E.; 395 m. from Marseilles.

**Port Accommodation.**—Harbour sheltered by breakwaters of an area of 125 acres. Quayage, 3000 ft., with depth alongside of 24 ft.

**Steam Communication.**—Compagnie de Navigation Mixte from Marseilles.

**Trade.**—Exports: wheat, barley, wine, cork, esparto, &c.; imports: coal, timber, manufactured goods.

**Philippine Islands.**—Area, 115,026 sq. m. Pop. 7,635,426 (1903).

**Physical Features.**—Coasts broken and irregular, with numerous coral reefs; interior mountainous, with many volcanoes, active and inactive; mountain slopes and plains very fertile; several lakes; watered by many rivers and streams; much of the land is under tropical forests.

**Climate.**—Healthy, except in swampy districts; under the influence of the monsoons, and subject to fierce typhoons. Mean temperature at Manila (December the coldest month), 78.26° F. (May the hottest month), 86° F.; earthquake shocks frequent.

**Resources and Production.**—Agriculture was in a primitive state, but is improving since the advent of the Americans; rice is the principal crop, and is grown for home consumption; hemp, tobacco, and sugar-cane are largely cultivated and exported. The forests yield valuable timber, gums, and dyewoods. The mineral resources are as yet undeveloped, but gold, silver, platinum, copper, lead, cinnabar, galena, sulphur, petroleum, rock salt, kaolin, and gypsum have been found.

**Shipping and Railways.**—Principal ports, Manila, Cebu, and Iloilo. Vessels entered (1904), 4507 steamers, of 2,011,050 tons, and 4941 sailing vessels, of 210,507 tons. Railways, 200 m.

**Exports** (1905-6), £6,559,000; to U.K., £1,541,000. **Imports,** £5,031,800; from U.K., £1,073,600.

**Piræus,** chief port of Greece; in lat. 37° 56′ 10″ N., and long 19° 52′ 30″ E.; connected with Athens by a railway 5½ m. long. Distant from Malta, 539 m.

**Port Accommodation.**—Area of harbour, about 500 acres. Vessels drawing not more than 26 ft. can always enter. Quayage, about 1¼ m. Loading and unloading by lighters. Improvements in progress.

**Steam Communication.**—Rubattino from Genoa and Brindisi; Compagnie Marseillaise.

**Trade.**—Exports: hardly any; imports: coal, iron, and general merchandise, £3,119,149 (1905). B. C.

**Pisagua,** port of Chile; in lat. 19° 36′ S., and long. 17° 15′ W.

**Port Accommodation.**—Good anchorage close in shore, in 20 to 50 fathoms. Loading by lighters.

**Steam Communication.**—P.S.N. and Cia Sud-Americana de Vapores joint service from Panama.

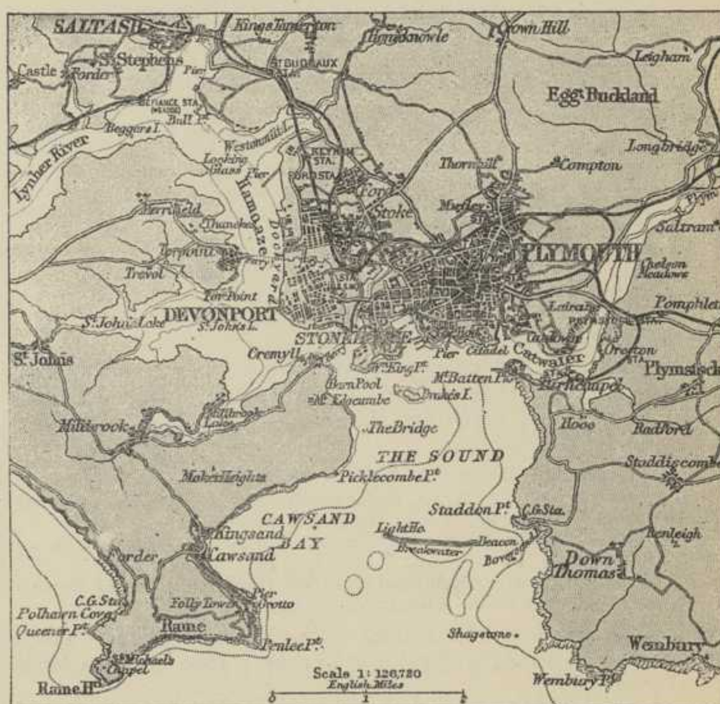
**Trade.**—Exports: chiefly nitrate (1903), £1,141,000; imports: coal and general merchandise, £251,000. B. V.-C.

**Plymouth,** port and coaling station on the south coast of Devon; in lat. 50° 22′ N., and long. 4° 9′ W.; 315 m. from London, and 336 from Liverpool.

**Port Accommodation.**—Anchorage in Plymouth Sound at an average depth of 30 ft. at low water. There are three mercantile harbours, and docks with depths on sills at ordinary high water ranging from 9 to 18 ft., patent slips, &c. Accommodation for vessels of all sizes.

**Steam Communication.**—U.C. for S. Africa, Orient and Ham.-Am. lines, P.S.N., B.I.S.N., and R.M.S.P.

**Trade.**—Exports (1905), £171,357; imports: grain, wood, sugar, &c., £1,614,918.




**Port Adelaide,** port and coaling station of South Australia, 7½ m. from the capital. Lat. 34° 56′ S.; long. 138° 36′ E. From London, 10,890 m. by Suez, and 13,010 by the Cape; from Melbourne, 504 m.

**Port Accommodation.**—13,626 feet of quayage, with depths alongside of 10 to 24 ft. at low water, ordinary springs. An outer harbour, with depth of 33 ft. at low water. Dry dock, 470 ft. long, and slips.

**Steam Communication.**—Orient, P. and O., Pacific line, N.D.L., Blue Anchor line, and White Star line.

**Trade.**—Exports: wool, copper, hides, gold, &c.; imports: general European merchandise. Value of trade, £9,604,000.

**Port au Prince,** cap. and port in Hayti; in lat. 18° 33′ N., and long. 72° 19′ 46″ W.; 3973 m. from Liverpool, and 1367 from New York.

**Port Accommodation.**—Tidal harbour, with depth at entrance and beside wharf of 14 ft. Length of wharf, 500 ft. Steamers discharged by lighters.

**Steam Communication.**—D.W.I.M. from Amsterdam; Atlas line from New York; C.G.T. from Havre.

**Trade.**—Exports: coffee, cocoa, mahogany. B. C.

**Port Darwin,** port of the Northern Territory of South Australia; in lat. 12° 28′ S., and long. 130° 51′ E.

**Port Accommodation.**—Depth at entrance, 57 ft. at high water ordinary neaps. A jetty 1120 ft. long has a depth alongside of 11 fathoms at low water.

**Steam Communication.**—Eastern Australian S. Nav. Co. and China Nav. Co. from Adelaide.

**Trade.**—Exports: wool, gold, copper, cattle.

**Port Elizabeth,** port of Cape Colony, on Algoa Bay; in lat. 33° 57′ S., and long. 25° 37′ E.; 436 m. from Cape Town.

**Port Accommodation.**—Good and sheltered anchorage. Three jetties, with depth alongside of 22 ft. at low water. Steamers of 1200 tons net register can be berthed at the south jetty.

**Steam Communication.**—U.C line from Southampton; B. and C. from London.

**Trade.**—Exports: wool, skins and hides, mohair, linseed, feathers, &c.; imports: general merchandise.

**Port Jackson.** *See* **Sydney.**

**Portland,** port and coaling station in Maine, U.S.A.; in lat. 43° 39′ N., and long. 70° 16′ W.; 2782 m. from Liverpool, and 328 from Halifax, N.S.

**Port Accommodation.**—Depth, 8 to 11 fathoms at entrance to harbour, and 5 to 8 at high water spring tides in the inner harbour. Twenty-five wharves, with 5 miles of quayage. At the Grand Trunk wharves ocean steamers lie in 30 ft. of water at low tide.

**Steam Communication.**—Dominion and Allan lines from Liverpool in winter.

**Trade.**—Exports: grain, meat, cheese, apples, &c.; imports: coal, clay, &c. B. V.-C.

**Port Louis,** Mauritius; in lat. 20° 10′ S., and long. 57° 30′ E.; 7080 miles London by Suez, and 8780 by the Cape. Coaling station.

**Port Accommodation.**—Good anchorage at the entrance in 10 to 30 fathoms. Vessels moored inside in tiers in depths up to 24 ft. Berths in the Mauritius and Albion Docks of 14 and 16 ft. Two dry docks, the larger 430 ft. long, and patent slip.
**Steam Communication.**—U.C. from Southampton; B.I.S.N. from Calcutta; M.M. from Marseilles.

**Port of Spain,** port of Trinidad, and a coaling station; in lat. 10° 39′ N., and long. 63° W.; 4012 m. from London, and 207 m. from Barbados.

**Port Accommodation.**—Harbour can receive the largest vessels. Vessels drawing 10 ft. can come alongside the quay, and those drawing 15 ft. alongside the jetty. Patent slip, 376 ft. long.
**Steam Communication.**—R.M.S.P. from Southampton (*viâ* Barbados); D.W.I.M. from Amsterdam.
**Trade.**—Exports: cocoa, sugar, asphalt; imports: textiles, hardware, rice, flour, &c.

**Porto Rico.**—Area, 3600 sq. m. Pop. 954,000.

**Physical Features.**—Interior mountainous; highest peak, Yunque, 3670 ft.; coast plains and river valleys exceedingly fertile; on the hills, tropical forests; drained by many short streams.
**Climate.**—Mean annual temperature, 80.7° F. The NE. trade-winds b ing abundant rains.
**Resources and Production.**—Agriculture is the chief resource. Yield of coffee (1903), 33,450,500 lbs.; sugar, 104,490 tons; tobacco, 12,000,000 lbs. Bananas and other fruits and vegetables are grown. Minerals exist, but are not worked. Salt works yield 10,000,000 lbs. annually. There are also exports of animals and their products (1904), $481,000; straw hats, $61,700; besides rum, maize, &c.
**Shipping and Railways.**—Chief ports, San Juan and Ponce. Vessels entered (1904), 526, of 577,079 tons; cleared, 561, of 631,020 tons.
**Trade.**—Exports: sugar, tobacco, fruits, coffee, and cotton (1905), £4,292,690; imports: general merchandise, £3,855,746. The trade is chiefly with the United States.

**Port Said,** port and coaling station at the entrance of the Suez Canal, Egypt; in lat. 31° 16′ N., and long. 32° 19′ E.; 3248 m. from London; 3216 from Liverpool; 1506 from Marseilles; and 925 from Brindisi.

**Port Accommodation.**—A depth of 26 ft. in the port. Vessels discharged by lighters. Works under construction, which within the next five years will more than double the area of the port.
**Steam Communication.**—Steamers to the East, Australia, and the east coast of Africa.
**Trade.**—Exports: cotton and oil-seeds (1904), £522,000; imports: grain, coal, textiles, &c., £1,404,000. B. C.

**Port Stanley,** port and coaling station of the Falkland Islands; in lat. 57° 41′ S., and long. 57° 51′ W.; 1010 m from Monte Video.

**Port Accommodation.**—The largest vessels can enter the port. There are two jetties, each 250 ft. long, with 14 ft. of water alongside.
**Steam Communication.**—Kosmos SS. Co. from London; P.S.N. from Liverpool.
**Trade.**—Exports: chiefly wool and frozen mutton, £127,000; imports: general goods, £49,500.

**Port Sudan,** in the Red Sea, 30 m. N. of Suakin, terminus of the Berber Railway.

**Port Talbot,** port and coaling station in South Wales, between Cardiff and Swansea.

**Port Accommodation.**—Two docks, the newer with a depth of 27½ ft. Special facilities for coaling; graving dock, 435 ft. long.
**Trade.**—Exports: coal, iron, copper (1905), £809,200; imports: iron and copper ore, timber, &c., £1,151,100.

**Portugal.**—Area, 35,254 sq. m. Pop. (1905), 5,197,000.

**Physical Features.**—Coast generally low and flat; surface N. of the Tagus mountainous, with fertile intervening valleys and plateaus; to the S. large undulating plains; principal rivers, the Tagus, Douro, Mondego, Guadiana, and Minho.
**Climate.**—Oceanic in the W. districts; temperate in the N. with abundant rainfall; hot and dry in the S. Mean temperature at Lisbon (January), 50°; (July), 69.8° F. Maximum at Campo Maior, in July, 111° F.
**Resources and Production.**—A large proportion of the soil is waste land; the chief cereals grown are wheat, maize, and rye; onions and potatoes, olives, tomatoes, oranges, figs, and other fruits are largely cultivated and exported. The most important product is wine, of which there is a great output annually; exported (1904), 16,045,700 gallons (£2,095,800). Among the valuable forest products is the cork tree, and a large trade is done in raw and manufactured cork—(exports in 1904, 70,380 cwt., valued at £220,620). Mineral wealth considerable, but many mines unworked for want of coal and cheap transport; among minerals worked are arsenic, copper, gold, lead, iron, manganese, wolfram, zinc, salt, gypsum, lime, and marble.
**Shipping and Railways.**—Principal ports, Lisbon and Leixões. Vessels entered (1904), steamers of 12,472,320 tons, and sailing vessels of 198,685 tons; cleared, steamers of 12,451,721 tons, and sailing vessels of 197,639 tons. Merchant fleet (1904), 77 steamers of 50,487 tons, and 497 sailing ships of 63,048 tons. Railways open (1904), 1486 m.
**Exports** (1905), £6,541,000. **Imports,** £13,655,000.

**Progreso,** port of Mexico, in Yucatan; in lat. 21° 17′ N., and long. 89° 39′ W.; 417 m. from Havana, and 542 from New Orleans.

**Port Accommodation.**—Open roadstead, with anchorage in 4 fathoms. Three piers, of which the longest, 1300 ft., can be reached by vessels drawing 12 ft. at high water ordinary springs.
**Steam Communication.**—Prince line from London; Leyland line from Liverpool; Ward line from New York.
**Trade.**—Exports: Sisal hemp, logwood, mahogany, &c. B. V.-C.

**Puerto Cabello,** port in Venezuela; in lat. 10° 40′ N., and long. 63° 5′ W.; 55 m. from La Guaira.

**Port Accommodation.**—Depth at low water, at entrance and at quayside, 26 ft. Quayage, 1500 ft.
**Steam Communication.**—R.M.S.P. from Southampton; W.I. & P., and Leyland line from Liverpool; D.W.I.M. from Amsterdam.
**Trade.**—Exports: coffee, cocoa, hides and skins, &c. (1905), £386,838; imports: provisions, hardware, &c., £473,583. B. V.-C.

**Puerto Cortes,** port of Honduras; in lat. 15° 37′ N., and long. 87° 56′ W.

**Port Accommodation.**—Depth at entrance, 40 ft. Honduras Railway wharf, 120 ft., with depth alongside of 35 ft., is in bad condition.
**Steam Communication.**—Cent.-Am. from New York.
**Trade.**—Exports: bananas, mahogany, indiarubber, &c.; imports: cotton goods, hardware, salt, &c.

**Punta Arenas (1),** port and coaling station in the Straits of Magellan; in lat. 53° S., and long. 70° 55′ W.; 7382 m. from London, and 1442 from Valparaiso.

**Port Accommodation.**—Good anchorage in 6 to 15 fathoms. Vessels discharged by lighters.
**Steam Communication.**—P.S.N. and Lamport and Holt from Liverpool.
**Trade.**—Exports: wool, hides, sealskins, &c. (1905), £128,429; imports: £461,214. B. V.-C.

**Punta Arenas (2),** port of Costa Rica, in the gulf of Nicoya, on the Pacific coast; in lat. 9° 58′ N., and long. 84° 32′ W.

**Port Accommodation.**—Good anchorage for the largest ships.
**Steam Communication.**—P.M. from San Francisco.
**Trade.**—Exports: coffee, timber, and dyewoods. B. V.-C.

**Quebec,** port and coaling station of Canada, on the St. Lawrence river; in lat. 46° 49′ N., and long. 71° 13′ W.; 2685 m. from Liverpool, and 728 from Belle Isle.

**Port Accommodation.**—Tidal basin of 20 acres, with 3200 ft. of quayage, having depths alongside of 25 to 30 ft. at low water ordinary springs. Wet dock of 36 acres, with 3300 ft. of quayage, having depths alongside of 22 to 27 ft. Depth of water on sill at ordinary neaps, 30 ft. Three floating docks, patent slip and gridirons.
**Steam Communication.**—Allan and Beaver lines from Liverpool in summer.
**Trade.**—Exports: grain, timber, &c. (1904), £764,000; imports: coal, hardware, groceries, &c., £1,813,600.

**Queensland.**—Area, 668,500 sq. m. Pop. (1905), 528,048.

**Physical Features.**—Coast studded with reefs and islets; interior traversed from N. to S. by mountain ranges, spreading out westwards into plateaus and fertile plains; watered by numerous rivers, some of which are navigable for short distances.
**Climate.**—Hot in summer, but healthy. Mean shade temperature at Brisbane (12 years average), 69.3° F.; rainfall about 30 in.
**Resources and Production.**—Mining, agriculture, cattle, and sheep farming and fruit-growing are the chief occupations. The chief crops in the year 1905-6 were: wheat, 1,137,321 bus.; maize, 2,164,674 bus.; barley, 61,816 bus.; potatoes, 11,308 tons; tobacco, 1,145,760 lbs.; and of cotton, the cultivation of which is spreading, 113,098 lbs. 147,688 tons of cane-sugar were produced in 1904, and 4,491,407 gals. of molasses. The live-stock in 1905 consisted of 430,565 horses, 2,963,695 horned cattle, 12,535,231 sheep, and 164,087 pigs. The wool exports are included in those of the Australian Commonwealth; *see* Victoria. The mineral products in 1905 were of the value of £3,726,275. The most important outputs were: gold, 592,620 fine oz. (£2,517,295); copper, 7221 tons (£503,547); tin, 3945 tons (£297,454); coal, 529,326 tons (£155,477); and wolfram, 1409 tons (£99,873).
**Shipping and Railways.**—The principal ports are: Brisbane (the capital), Rockhampton, Mackay, Cooktown. Registered shipping (1905), 120 sailing vessels of 7361 tons, and 190 steamers of 16,585 tons. Length of railways opened, 3383 m.
**Trade.**—Exports, excluding trade with the other states of the Commonwealth (1905), £3,384,856; to U.K., £1,871,533. Imports, £3,168,627; from U.K., £2,102,390.

**Queenstown.** *See* **Cork.**

**Rangoon,** chief port and coaling station of Burma, on a branch of the Irawadi River, 21 m. from the sea; in lat. 16° 46′ N., and long. 96° 13′ E. Distance from London by Suez, 7935 m.; from Calcutta, 787 m.

**Port Accommodation.**—Depth of water at entrance to port at ordinary neap tides, 21 ft. Several private quays, with an aggregate length of over 2900 ft. Patent slip and gridiron.
**Steam Communication.**—B.I.S.N. from London; Bibby line from Liverpool; Nederland and Rotterdam Lloyd joint service between Calcutta and Java.
**Trade.**—Exports: teak, petroleum, rice, &c. (1904–5), £8,567,654; imports, £5,812,554.

**Revel,** port and coaling station of Russia, on the Gulf of Finland; in lat. 58° 15′ N., and long. 24° 30′ E.; 1220 m. from London.

**Port Accommodation.**—Good anchorage in roads. Depth at entrance to port, 30 ft.; in port, down to 25 ft.
**Steam Communication.**—Wilson line from London and Hull.
**Trade.**—Exports: corn, hemp and flax, timber, eggs and butter (1904), £2,429,000; to U.K., £1,651,000; imports: colonial produce, wine, tobacco, cotton goods, machinery, £7,791,000; from U.K., £2,870,000. B. V.-C.

**Rhodesia.**—A territory in South Africa, extending from the north and west of the Transvaal to the Congo Free State and Tanganyika, which is administered by the British South Africa Company. South of the Zambezi lies Southern Rhodesia, while the tract to the north of the river is divided into North-Eastern and North-Western Rhodesia. Area, 431,265 sq. m. Pop. about 1,378,000.

**Physical Features.**—The surface is mostly a rich and fertile plateau, rising to a height of 4000 to 7000 ft., and traversed by ranges of hills. The climate is generally salubrious, except in the marshy tracts in the north and the low-lying valleys of the Zambezi and Limpopo. The temperature ranges from 49° to 87° F.; rainfall, 22 to 40 in., mostly between November and April.
**Resources and Production.**—Large areas of land are adapted for agriculture, and minerals are abundant. In Southern Rhodesia, which is being developed by Europeans, cotton, tobacco, sugar, fruit, &c., are cultivated, tobacco being a very promising crop, and cattle and sheep farming is carried on. But at present mining is the most important industry. In the year

1905-6 the value of the gold obtained was £1,599,195; of coal, £62,285; silver, £9390; lead, £6232; and diamonds, £4208.

**Railways.**—The country is traversed by the Cape to Cairo railway, which has been carried over the Zambezi into NW. Rhodesia. Total length of lines opened in 1905, 1581 m.

**Trade.**—Exports included in those of the Cape of Good Hope. Imports (1905), £1,213,776.

**Riga,** port and coaling station on the Dwina, 8 m. from the Gulf of Riga, Baltic Sea, Russia; in lat. 57° 3′ 22″ N., and long. 24° 1′ 30″ E.; 1152 m. from London.

**Port Accommodation.**—Vessels drawing 22 ft. can reach Riga. Depth on bar, 24 ft. on an average. Three open docks with from 20 ft. Quays of an aggregate length of 14,000 ft., and a new harbour, two miles below Riga, with 4300 ft. of quayage, with a depth of 24 ft. alongside. Two floating docks, the larger 158 ft. long, and patent slip.

**Steam Communication.**—Wilson line from London and Hull.

**Trade.**—Exports: corn, hemp, timber, eggs and butter (1905), £13,955,256; imports: coal, machinery, groceries, herrings, £8,281,280. B. C.

**Rio de Janeiro,** capital of Brazil, port and coaling station; in lat. 22° 24′ S., and long. 43° 9′ W.; 5225 m. from London.

**Port Accommodation.**—Harbour of 30 sq. m., with depths of 30 to 70 ft. Depth of entrance at the shallowest part, 33 ft. during neaps. From May to November vessels can go alongside the bonded warehouses, where there are depths of 12 to 21 ft. Quays 16,400 ft. long under construction, of which one, 1640 ft. long, is now open; five dry docks, with lengths 370 to 520 ft., and three slips.

**Steam Communication.**—P.S.N. and Lamport and Holt line from Liverpool; R.M.S.P. from Southampton; N.Z.S. from London.

**Trade.**—Exports: coffee, hides, timber, gold, £6,992,000 (1904); imports: manufactured goods, provisions, &c., £10,098,000. B. C.

RIO DE JANEIRO

Scale 1:150,000

**Rio Grande do Sul,** port in Brazil, 9 m. up the Rio Grande; in lat. 32° 7′ S., and long. 52° 5′ W.; 5938 m. from London.

**Port Accommodation.**—Accessible for vessels drawing not more than 12½ ft. Two quays, 1500 and 900 ft. long. respectively. Patent slip, 600 ft. long.

**Trade.**—Exports: animals, hides, &c., £654,000 (1904); imports: manufactured goods, metals, provisions, £812,000. B. C.

**Rockhampton,** port of Queensland, 43 m. up the river Fitzroy; in lat. 23° 30′ S., and long. 151° E.; 11,980 m. from London, and 355 from Brisbane.

**Port Accommodation.**—Large steamers lie outside the mouth of the Fitzroy River in 4 fathoms low water. About 2000 ft. of quayage, with depths alongside down to 20 ft. Patent slip, 172 ft. Broadmount, at the mouth of the river, has 500 ft. of quayage, with a depth of 25 ft. at high water ordinary springs.

**Steam Communication.**—B.I.S.N. from London and coasting steamers.

**Trade.**—Exports: wool, gold, copper, hides.

**Rosario,** port and coaling station in Argentine, on the river Parana, 240 m. above Buenos Aires; in lat. 32° 55′ S., and long. 60° 37′ W.

**Port Accommodation.**—There are several bars in the river at depths varying from 14 to 25 ft., according to the state of the river. Government wharf, with depth of 14 to 25 ft., and three private wharves.

**Steam Communication.**—Lamport, Nelson, Maciver, Houlder, and Houston lines from Liverpool; Kosmos from London.

**Trade.**—Exports: wheat, maize, linseed, wool, hides, &c. £9,620,000 (1905); imports: timber, coal, manufactured goods, petroleum, &c., £4,526,000. B. C.

**Rostof-on-Don,** a port of South Russia, on the river Don, 620 m. from Constantinople. The depth of water at the mouth of the river varies from 2 to 9 ft.

**Trade.**—Exports: grain, wool, tallow, &c. (1905), £7,109,860; imports about £4,500,000.

**Rotterdam,** port and coaling station of Holland, on the Nieuwe Maas, 11 m. from its mouth in the North Sea; 182 m. from London, and 300 from the Tyne.

**Port Accommodation.**—Vessels of 26 or 27 ft. draught can reach Rotterdam, where there is ample accommodation for vessels of all kinds, floating docks, patent slips, &c.

**Steam Communication.**—General St. Nav. Co. from London; Gt. Eastern Ry. from Harwich; Gt. Central Ry. from Grimsby, Hull; Ned. S. for Batavia, &c.

**Trade.**—Exports: provisions, manufactured goods, sugar, cattle, &c.; imports: grain, coal, sugar, coffee, tobacco, cotton, &c. B. C.

**Roumania.**—Area, 50,702 sq. m. Pop. (1899), 5,956,690.

**Physical Features.**—The whole country forms a terraced plain, sloping to the Danube, with the slopes of the Carpathians on the W. and the steppe land of the Dobruja in the E.; there are many patches of marsh-land in the river valleys, watered by the Danube and its tributaries.

**Climate.**—Subject to extremes of heat and cold (96.8° F. and -18.4° F.) on the plains; mean annual temperature, 52.9° F. (summer, 72.5°; winter, 27.5°); rainfall, 25¼ in.

**Resources and Production.**—Upwards of 60 per cent. of the population are engaged in agriculture, the chief crops having been in 1905 as follows: wheat, 100,135,054 bus.; maize, 57,442,674 bus.; barley, 25,567,360 bus.; oats, 18,387,319; and potatoes, 99,976 tons. 38,712,696 gals. of wine were produced, flax and hemp fibre and seed and beetroot sugar. The State forests cover 2,280,000 acres, and consist mostly of oak, beech, pine, and fir. The Carpathians are rich in minerals; coal is worked, and the output of crude petroleum (592,000 tons in 1905) continues to increase.

**Shipping and Railways.**—Principal ports, Braila, Constantza, Galatz, Sulina. Merchant fleet (1905), 86 steamers of 18,922 tons, and 311 sailing vessels of 75,121 tons. Vessels entered (1905), 29,696, of 8,644,359 tons; cleared, 29,543 vessels, of 8,630,984 tons. Length of railway lines in operation, 1986 m.

**Exports** (1905), £18,284,000; to U.K., £1,259,500. **Imports,** £13,501,500; from U.K., £2,033,500.

**Russian Empire.**—Extending from the Baltic Sea eastwards to Behring Strait, the Russian Empire comprises about one-seventh of the area of the land of the globe. Areas: Russia in Europe, 1,859,195 sq. m.; Poland, 49,084; Finland, 144,211; Russia in Asia, 6,326,554. Total, 8,379,044. Pop. (1903), 141,200,000.

**Physical Features.**—The surface of Russia in Europe is on the whole a great undulating plain with the Valdai hills in the centre. On the eastern side runs the Ural mountains, and on the south-east is the mountainous district of Caucasia. In the south is the black earth region of great fertility. Siberia consists of the low plain of the Ob and the plateau of the Yenisei and Lena, surrounded by chains of mountains. Southwards the Kirghiz steppes and the plain of Turkestan lead up to the Pamir plateau. The chief rivers are the Volga, Don, Dniester, and Dnieper in Europe, the Ob, Lena, Amur in Siberia, and the Amu-darya and Syr-darya in Central Asia.

**Climate.**—Varies considerably with the latitude; the winters are generally long and cold. The mean temperature of St. Petersburg is 24.8° F. in January and 62.6° in July; at Astrakhan 23° and 75.2° respectively. Rainfall, 18 in. at St. Petersburg and 4.8 at Astrakhan. In Siberia the climate is very severe, the lowest temperatures in the world occurring at Verkhoyansk, where the annual mean is about zero.

**Resources and Production.**—Of the area of Russia in Europe, including Poland, about 43½ per cent. is under cultivation and 38 per cent. is clothed with forests. In the year 1904 more than 332 million cwts. of wheat were grown and 487 millions of rye. Of other crops the quantities in 1905 were barley, 145 million cwts.; oats, 223 millions; millet, 30 millions; potatoes 28 million tons. The crop of sugar beet in 1906 was the largest on record, being fully 9,314,000 tons (Turkestan crop included). Large quantities of hemp, flax, rape, sunflower, and other oil-seeds are grown. In Western Siberia the growth of cereals is expanding, and a large proportion of the butter exported from Russia comes from there (95,605,174 lbs. during 10 months of 1906). Cotton and rice are cultivated in Russian Central Asia, tea on the Black Sea coast of Transcaucasia. Mining is pursued on the Urals, the Altai district, and other parts of Siberia, coal especially in the Donetz basin and petroleum in the Caucasus. In 1904, 1,205,690 oz. of unrefined gold, 18,620,000 tons of coal, and 9,942,000 tons of naphtha were extracted. In 1905 the output of platinum in the Urals, the chief source of the world's supply, was 154,471 oz. Of pig-iron 2,900,000 tons were manufactured in 1904, and 2,408,000 of iron and steel.

**Shipping and Railways.**—The chief ports are St. Petersburg, Revel, Riga, Windau on the Baltic, Archangel on the White Sea, Odessa and Taganrog, Novorossisk and Batum on the Black Sea and Vladivostok on the Pacific. The merchant fleet at the end of 1904 consisted of 2533 sailing vessels of 283,550 tons, and 834 steamers of 382,867 tons, vessels of 25 net tons and upwards being reckoned. 11,777 vessels of 11,395,000 tons entered Russian ports, and 11,749 of 11,401,000 tons cleared. Railways in working order (1905), 38,243 m.

**Trade,** by European and Black Sea frontiers.—Exports (1905), £107,482,000; imports, £58,427,000.

**Saigon,** port and coaling station of Cochin-China; in lat. 10° 51′ N., and long. 106° 45′ E.; about 42 m. from the sea, on the Donoi river; 8990 m. from London, and 630 from Singapore.

**Port Accommodation.**—River navigable by vessels of any size. Anchorage below the town in 8 to 10 fathoms. Dry dock, 498 ft. long, and 3 slips.

**Steam Communication.**—M.M. from Marseilles.

**Trade.**—Exports: rice, tobacco, indigo, pepper, cotton, &c., £5,582,000 (1905); imports: textiles, metals, wines, £5,159,000. B. C.

**St. John,** port and coaling station of New Brunswick, on the bay of Fundy; in lat. 45° 14′ N., and long. 66° 3′ W.; 2530 m. from Liverpool.

**Port Accommodation.**—Depth at entrance, 21 ft. at low water ordinary springs. 5000 ft. of quayage, with depth alongside of 17½ to 29½ ft. at low water. Also government railway quay and 3 gridirons.

**Steam Communication.**—Furness line from Liverpool, and Beaver line in winter.

**Trade.**—Exports: lumber, grain, meat, £2,737,000 (1904); imports: iron and steel goods, sugar, coal, cotton-wool, &c., £1,369,000.

**St. John's,** port and coaling station in Newfoundland; in lat. 47° 35′ N., and long. 52° 41′ W.; 1992 m. from Liverpool, and 540 from Halifax, N.S.

**Port Accommodation.**—Depth at entrance by Chain Rock, 42 ft. at low water ordinary springs. Two quays, 150 and 200 ft. long respectively, with depths at low water of 48 and 30 ft. Dry dock, 610 ft. long, and floating dry dock.

**Steam Communication.**—Allan line from Liverpool.

**Trade.**—Exports: fish, sealskins, oil, iron and copper ore; imports: flour, textiles, hardware, coal.

**Sta. Lucia.** *See* **Castries.**

**St. Michael's** (Ponta Delgada), a port and coaling station in the Azores; in lat. 37° 40′ N., and 25° 36′ W.; 786 m. from Lisbon.

**Port Accommodation.**—Depth at entrance, 9 to 12 fathoms; inside, 5 to 10 fathoms. Breakwater quay, 1300 ft. long, can be reached by vessels drawing 24 ft.
**Steam Communication.**—Demerara, Berbice, and Direct lines from London; Empresa Insulana de Navegacão from Lisbon.
**Trade.**—Exports: grain, fruit, cattle; imports: coal, cotton, woollen goods, &c.

**St. Paul de Loanda,** capital and chief port of the Portuguese colony of Angola, and a coaling station; 4956 m. from London.

**Port Accommodation.**—About 2 sq. m. of good anchorage in 15 fathoms. Quays available only for lighters.
**Trade.**—Exports: coffee, rubber, wax, &c. Value of trade (1905), £1,158,600.

**St. Petersburg,** capital and port of Russia, and a coaling station, at the mouth of the Neva; in lat. 59° 56′ N., and long. 30° 40′ E.; 1307 m. from Hull, and 390 from Stockholm.

**Port Accommodation.**—A maritime canal across the bay of Neva from Kronstadt allows vessels drawing 22 ft. to reach the city.
**Steam Communication.**—Wilson line from Hull; the United Shipping Co. from London; Hanseatic Co. from Lübeck. B. C.
**Trade.**—Exports: grain, hemp and flax, linseed, timber, &c.; imports: coal, textiles, tobacco, hardware, colonial produce.




**St. Thomas.**—Danish island in the West Indies; in lat. 18° 19′ N. and long. 64° 55′ W.; 3595 m. from Liverpool. Coaling station. Area, 53 sq. m. Pop. 11,012.

**Port Accommodation.**—Excellent harbour, easy of access at all times. Steamers can lie alongside the wharves. Floating dock, 250 ft. long, and slipway.
**Steam Communication.**—R.M.S.P. from Southampton; Cent.-Am. from New York; Leyland line from Liverpool.
**Trade.**—Exports: sugar and rum; imports: coal, provisions, petroleum, dry goods. B. V.-C.

**S. Thomé** (St. Thomas), an island in the Gulf of Guinea, nearly on the Equator, belonging to Portugal. Area, 318 sq. m. Pop. 37,776. It produces a large quantity of cocoa—20,526 tons in 1904. The port is Anna de Chaves. Another Portuguese island, Principe, lies 90 m. to the NE., and also produces cocoa, coffee, &c.

**St. Vincent,** West Indies. Kingstown is a port and coaling station; in lat. 13° 13′ N., and long. 61° 15′ W.; 3690 m. from Liverpool.

**Port Accommodation.**—An open roadstead with good anchorage.
**Steam Communication.**—R.M.S.P. from Southampton.
**Trade.**—Exports: arrowroot, sugar, cotton, &c. (1905), £53,078; imports, £69,097.

**Salonica,** port and coaling station of Turkey, at the head of the Gulf of Salonica; in lat. 48° 38′ N., and long. 22° 58′ E.; 250 m. from Smyrna.

**Port Accommodation.**—Deep and safe roadstead and quay, nearly 6000 ft. long. Loading and unloading by lighters.
**Steam Communication.**—Rubattino Co. from Genoa; Messageries Maritimes from Marseilles; Austrian Lloyd Co., &c.
**Trade.**—Exports: grain and flour, cocoons, hides, cattle, tobacco (1905), £1,250,000; imports: manufactured articles, sugar, rice, petroleum, wines and spirits, £2,300,000.

**Salvador.**—A republic of Central America. Area, 7225 sq. m. Pop. 1,007,000.

**Physical Features.**—Excepting the narrow strip of alluvial land along the Pacific coast, the surface forms a moderately high plateau, intersected by river valleys, and dominated by a series of volcanoes.
**Climate.**—More constant than that of the rest of Central America. Mean temperature on coast, 82.4° F.; on the plateau, 64.4°; San Salvador, 77°.
**Resources and Production.**—Agriculture is the main pursuit; the chief crop is coffee, of which 75,314,000 lbs. were exported in 1904; other crops are indigo, sugar, rubber, tobacco, rice, maize, &c. The forests yield rubber, balsam, valuable timber, and dyewoods. Minerals abound, but are hardly worked.
**Shipping and Railways.**—Principal ports are Acajutla, La Libertad, and La Union. Vessels (steamers) entered in 1904 at ports, 370 of 287,587 tons.
**Trade.**—Exports (1905), £1,116,000; imports, £869,200.

**Samarang,** port of Java at the mouth of the Samarang River; in lat. 6° 56′ S., and long. 110° 28′ E.; 230 m. from Batavia.

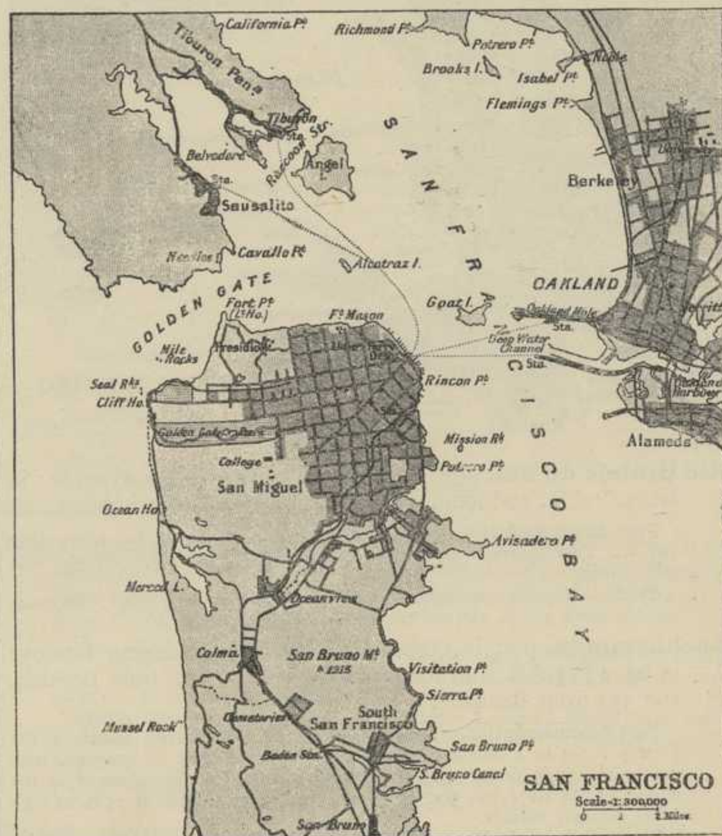
**Port Accommodation.**—Depth at entrance, 5½ ft. at low water ordinary springs; 4800 ft. of quayage, with 8½ ft. of water alongside at high water.
**Steam Communication.**—K. Paketvaart Maatschappij (inter-insular); M.M. from Marseilles; Ned. S. from Southampton.
**Trade.**—Exports: coffee, sugar, indigo, tobacco, rice. B. V.-C.

**San Domingo.**—One of the largest of the Greater Antilles, being only second to Cuba in area. The larger, eastern, part constitutes the republic of San Domingo. Area, 18,045 sq. m. Pop. 416,000. The western part is the republic of Haiti. Area, 10,204 sq. m. Pop. (1904), 1,425,000.

**Physical Features.**—The interior is traversed by four mountain chains enclosing three great valley depressions or plains; the highest point is Loma Tina (10,300 ft.). A large part is covered by virgin forest. Rivers are numerous, but of no great length or volume.
**Resources and Production.**—Sugar (now declining) forms the principal crop; cocoa, coffee, tobacco, and bananas are grown, and there is a large export trade in timber, dyewoods, &c. Minerals also abound, and include gold, iron, copper, coal, and salt.
**Shipping and Railways.**—The principal ports are Puerto Plata, and San Domingo in San Domingo, and Jacmel, Port au Prince and Aux Cayes in Haiti. Vessels entered ports of San Domingo (1905), 772, of 875,586 tons. Railways open, 117 m.; in Haiti, 43 m.
**Trade.**—Exports are chiefly sugar (San Domingo), coffee, logwood, cocoa. The value of the exports of San Domingo in 1905 was £1,417,000, and of the imports, £636,000; the statistics of Haitian trade are very defective. The United States is the chief country trading with this island.

**San Francisco,** port and coaling station of the United States, on the Pacific coast; in lat. 37° 48′ N., and long. 105° 15′ E.; 13,745 m. from Liverpool; 4521 from Yokohama, and 5905 from Wellington, N.Z.

**Port Accommodation.**—4 to 5½ fathoms of water on the bar at low water ordinary springs. Sea-wall, 9200 ft. long, with depth alongside of 22 to 28 ft.; more than 47,000 of wharfage, with depths of 17 to 30 ft., and other wharves. Several dry docks, the largest being 750 ft. long.
**Steam Communication.**—P.M. to Hongkong, and also to Central America; Am. Austr. to Sydney and Auckland; O. and O. to Hongkong.
**Trade.**—Exports: gold, silver, copper, wool, wheat, hides, &c., £9,841,000 (1905); imports: coal, sugar, rice, and manufactured goods, £9,122,000. B. C.




**San José,** port of Guatemala, on the Pacific; in lat. 13° 55′ N., and long. 90° 50′ W.

**Port Accommodation.**—Open roadstead. Vessels anchor about half a mile from the shore, and are discharged by lighters.
**Steam Communication.**—P.M. Co. from San Francisco.
**Trade.**—Exports: coffee, rubber, hides; imports: cottons, flour, hardware.

**San Juan,** capital and chief port of Porto Rico; in lat. 18° 22′ N., and long. 60° 7′ W.; 975 m. from Havana.

**Port Accommodation.**—Depth at entrance, 27 to 29 ft. Steamers discharged by lighters. Sailing vessels drawing less than 17 ft. can berth at the general wharf.
**Steam Communication.**—C.G.T. from Havre and Bordeaux.
**Trade.**—Exports: coffee, tobacco, sugar. B. C.

**Santa Cruz,** port of Teneriffe, Canary Islands, and a coaling station; in lat. 28° 28′ N., and long. 16° 15′ W.; 1720 m. from London.

**Port Accommodation.**—Mole 1900 ft. long, with depth of 18 ft. alongside at low water.
**Steam Communication.**—U.-C. from Southampton; B. & A.S.N. from Liverpool; Natal and Forwood lines from London.
**Trade.**—Exports: wine, almonds, cochineal. B. C.

**Santiago de Cuba,** port in the east of Cuba; in lat. 19° 58′ N., and long. 75° 52′ W.; 630 m. from Havana.

**Port Accommodation.**—Vessels drawing less than 15 ft. of water can lie alongside wharf.
**Steam Communication.**—New York and Cuba Mail S. Co. from New York.
**Trade.**—Exports: coffee, cocoa, sugar, tobacco, fruit. B. C.

**Santos,** port and coaling station in Brazil; in lat. 24° 30′ S., and long. 46° 15′ W.; 5408 m. from London.

**Port Accommodation.**—Depth at entrance, 30 to 40 ft. at high water ordinary springs. Quayage, 6000 ft., with 30 ft. of water alongside.
**Steam Communication.**—R.M.S.P. from Southampton; Lamport from Liverpool; A.L. from Trieste.
**Trade.**—Exports: chiefly coffee, £13,008,000 (1904); imports: cotton and cotton goods, hardware, rice, &c., £4,514,000. B. C.

**Savannah,** port and coaling station in Georgia, U.S.A., on the Savannah river, 18 m. from its mouth; in lat. 32° 5′ N., and long. 81° 8′ W.; 3620 m. from Liverpool.

**Port Accommodation.**—Depth on bar at ordinary low water, 20 ft. Three miles of quayage and wharfage, with 16 to 20 ft. alongside at low water, ordinary springs.
**Trade.**—Exports: cotton, lumber, rice; imports: pig-iron, general merchandise. B. C.

**Seattle,** port and coaling station in Washington, U.S.A., on the east coast of Puget Sound; in lat. 47° 36′ N., and long. 122° 20′ W.

**Port Accommodation.**—Several private wharves, with depths alongside of 25 to 40 ft. at high water. At North Seattle there are 2900 ft. of wharf frontage. Dry dock, 250 ft. long.
**Steam Communication.**—Pacific Coast SS. Co. from San Francisco; N.Y.K. from Yokohama.
**Trade.**—Exports: coal, lumber, wheat, cattle, fish; imports: iron, rice, tea, coffee, salt. Total exports of Puget Sound, £11,604,000 (1905); imports, £2,195,000. B. V.-C.

**Servia,** a small independent kingdom on the Balkan peninsula. Area, 18,645 sq. m. Pop. (1906), 2,688,747.

**Physical Features.**—Surface mountainous, intersected by long, narrow valleys, traversed by numerous mountain torrents; the principal rivers are the Danube, Save, Morava, Drina, Kolubara, Timok, and Nishava.
**Climate.**—Continental—Annual mean temperature, 55° F. (Jan., 49°; July, 73.5° F.), with a range from −13° in winter, to 113° F. in summer. Rainfall, 25 in.
**Resources and Production.**—Agriculture and forestry are the principal occupations. The chief crops in 1904 were wheat, 6,253,364 cwts.; maize, 4,747,520 cwts.; barley and oats, 2,259,685 cwts. Of plums, largely used for distilling spirits, 9,154,583 cwts. were gathered. Other products are wine, tobacco, and silk. Number of sheep (1900), 3,013,644; cattle, 942,087; pigs, 940,609. There are valuable mineral deposits, including coal of various kinds, gold, copper, zinc, lead, antimony, silver, iron, quicksilver, asbestos, arsenic, chromium, graphite, sulphur, marble, oil shales, &c.; output of coal (1904), about 99,500 tons.
**Railways.**—Length of lines open (end of 1904), 355 miles.
**Exports** (1905), £2,879,840. **Imports,** £2,224,040; from U.K., £212,560.

**Seville,** port and coaling station in Spain, on the Guadalquivir River, 70 m. from its mouth. Lat. 37° 22′ N.; long. 6° W.

**Port Accommodation.**—Depth at entrance to harbour, 16 ft. at low water ordinary springs. More than 7000 ft. of quayage, with depth alongside of 12 ft. at low water. Patent slipway, 400 ft. long.
**Steam Communication.**—Spanish line from London.
**Trade.**—Exports: ores, olive oil, oranges, cork, £1,941,000 (1905); imports: manufactured goods, colonial produce, &c., £1,532,000. B. V.-C.

**Seychelles.**—Area, 149 sq. m. Pop. 20,767 (1905).

**Physical Features.**—Composed of coral and granite, the latter rising into high peaks, mostly clothed with verdure; much forest.
**Climate.**—Equable, temperature ranging between 78.8° and 84.2° F., tempered by the monsoons and sea breezes; rainfall abundant.
**Resources and Production.**—Vanilla, cloves, pepper, coffee, cocoa, sugar-cane, rice, maize, manioc, tobacco, and tropical fruits are cultivated; and only in Seychelles is the *coco de mer* to be found growing. There is also a considerable trade in tortoise-shell and guano. Sandalwood and other trees grow in the forests.
**Shipping.**—Chief port, Port Victoria, Mahé.
**Exports** (1905), £59,297; to U.K., £13,173. **Imports,** £54,897; from U.K., £17,313.

**Shanghai,** port and coaling station in China, on the Wusung River; in lat. 31° 15′ N., and long. 121° 29′ E.; 10,650 m. from London *viâ* Suez, and 800 m. from Hongkong.

**Port Accommodation.**—Depth on bar at low tide, ordinary neaps, 19 to 20 ft.; in port, 21 ft. at low water. There are many quays belonging to various companies, and several dry docks.
**Steam Communication.**—P. & O. and Glen lines from London; N.D.L. from Southampton; MM. from Marseilles; N.Y.K. from Southampton.
**Trade.**—Exports: tea, cotton, rice, eggs, &c., (1905), £10,845,680; imports: cotton goods, metals, kerosene, &c., £13,869,496.

**Siam.**—Area, 220,000 sq. m. Pop. 6,070,000.

**Physical Features.**—Surface mountainous and wooded in the N.; in the W. consists of the valley of the Menam and its tributaries; in the E. of the Korat plateau.
**Climate.**—Hot, but not unhealthy. Mean annual temperature at Bangkok, 80.5° F.; rainfall, 54 in.
**Resources and Production.**—Rice is the chief agricultural product, and is largely grown for home use, as well as for exportation. Other produce, are fruits, sesame, pepper, hemp, tobacco, cotton, and coffee. There is also a trade in salt, dried fish, and cattle. The forests yield valuable timber, including teak. Among minerals found are gold, rubies, and sapphires.
**Shipping and Railways.**—Principal port, Bangkok. Merchant fleet (1905), 7 steamers, of 1775 tons, and 9 sailing ships (50 tons and upwards) of 2772 tons. Vessels entered (1905), 754, of 684,249 tons; cleared, 747, of 678,618 tons. Length of railways (1905), 402 m.

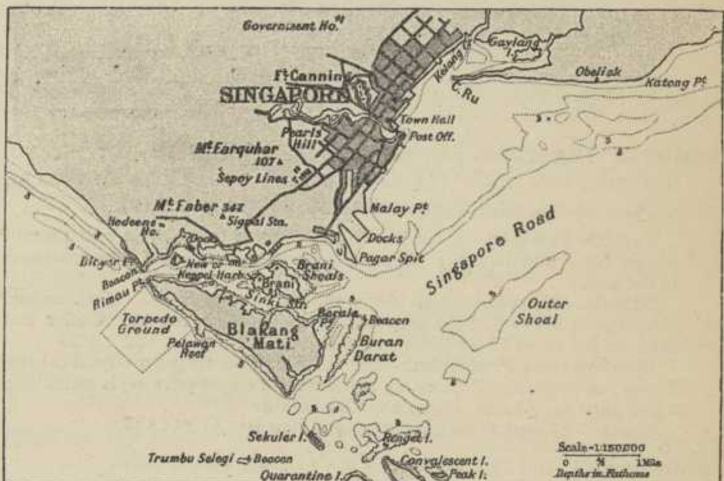
**Exports** (1905), £6,187,800; to U.K., £100,980. **Imports,** £4,126,140; from U.K., £720,900.

**Sierra Leone,** a British colony of West Africa. Coaling station. Distance from London, 3070 m. Area (including protectorate), 30,000 sq. m. Pop. 1,680,000.

**Physical Features.**—Moderately mountainous in the N.; low and swampy.
**Climate.**—Unhealthy, especially on the coast. Average annual temperature, 83° F. Rainfall varies from 138 in. at Freetown to 50 or 60 in the interior.
**Resources and Production.**—Agriculture is much neglected, and the trade is chiefly in wild products—palm oil, kola-nuts, copal, oil-seeds, and ginger.
**Port Accommodation.**—Capital, Freetown, with harbour deep enough for the largest vessels, and 1150 ft. of quayage (depth alongside, 10 to 12 ft.).
**Steam Communication.**—B. & A.S.N. from London, and Woermann line from Hamburg.
**Exports** (1905), £563,150; to U.K., £202,776. **Imports,** £702,648; from U.K., £520,144.

**Singapore,** port and coaling station on Singapore island, Malay peninsula; in lat. 1° 57′ N., and long. 103° 50′ E.; 8370 m. from London *viâ* Suez, and 1650 m. from Calcutta.

**Port Accommodation.**—Three wharves of an aggregate length of 11,000 ft., with depths alongside of 17 to 30 ft. at low water, several dry docks and slipways. Large sums are to be spent in the enlargement of the port.
**Steam Communication.**—B.I.S.N. from Calcutta; P. and O. and Ben line from London; Natal line from Cape Town; N.D.L. and N.Y.K. from Southampton; MM. from Marseilles.
**Trade.**—Exports: tea, sugar, spices, rice, rubber, &c.; imports: cotton goods, coffee, tea, tobacco, hardware, &c. The trade is to a large extent a transit trade.




**Skien,** port of Norway, on the Skienselv; in lat. 59° 14′ N., and long. 9° 34′ E.

**Port Accommodation.**—Channel up to Skien 19½ ft. deep. Quayage, 2500, with depth of 18 ft. in the outer harbour and 14 in the inner.
**Trade.**—Exports: timber, calcium carbide, &c., £348,900 (1904); imports: corn, meat, colonial produce, wine, &c., £350,800.

**Smyrna,** port and coaling station in Asia Minor; in lat. 28° 36′ N., and long. 27° 9′ E.; 2960 m. from London, and 198 m. from Piræus.

**Port Accommodation.**—Depth outside the breakwater, 40 to 70 ft.; inside, 23 to 35. Steamers discharged by lighters and pontoons.
**Steam Communication.**—Moss and Papayanni lines from Liverpool; Rub. from Genoa; MM. from Marseilles; A.L. from Trieste.
**Trade.**—Exports: dried fruits, grain, seeds, carpets, cotton, valonia, tobacco, &c. (1904), £4,754,533; to U.K., £2,594,601; imports: manufactured goods, colonial produce, coal, &c., £3,060,803; from U.K., £981,815. B. C.

**South Australia.**—Area (with Northern Territory), 903,690 sq. m. Pop. (1905), 378,208.

**Physical Features.**—Both coasts indented by many bays and gulfs, with islands lying off them; coastal belt flat; interior part of the continental plateau, with considerable portion of desert; broken by several mountain ranges; several large lakes (Eyre, Torrens, Frome, Gregory, &c.); principal rivers: the Murray, Barcoo, Hindmarsh, Wakefield, Inman, Torrens, Roper, &c.
**Climate.**—Mean temperature, 74° F. (winter, 53°; summer, 100°); rainfall, 16 in. on the plains, and 42 in. in the hills.
**Resources and Production.**—The yield of the chief crops in 1905 was: wheat, 20,143,798 bus.; barley, 505,916 bus.; oats, 283,987 bus.; potatoes, 20,328 tons. There is also an extensive fruit culture, including grapes, currants, apples, apricots, peaches, almonds, oranges, lemons, and olives, and 2,845,853 gals. of wine were made by growers in 1905. Live-stock, including that of the Northern Territory (1905), 216,345 horses, 647,631 cattle, 6,202,330 sheep. The minerals worked include copper, silver, and gold. The output in 1905 was: gold, 20,531 oz.; silver, 14,455 oz.; copper, 6548 tons.
**Shipping and Railways.**—Principal ports, Port Adelaide and Port Darwin. Registered shipping (1905), 109 steamers, of 38,155 tons, and 209 sailing vessels, of 19,304 tons. Railways open, 1780 m.
**Trade,** excluding interstate trade (1905), exports, £5,402,638; imports, £3,229,589.

**Southampton,** port and coaling station on Southampton water; 210 m. from London by sea.

**Port Accommodation.**—Entrance channel has 30 ft. of water at low water spring tides. Docks of the London & SW. Railway, with depths at low water of 20 to 26 ft. Dry docks, including the new Trafalgar dock, 875 ft. long; slipways and gridirons.
**Steam Communication.**—R.M.S.P. for W. Indies and S. America:

U. C. line for South Africa; American line for New York; N.D.L. for New York, the River Plate, and Australia; White Star for America, &c.

**Trade.**—Exports: cotton goods, leather, &c, £15,125,000 (1905); imports: grain, meat, dairy products, metals, &c., £15,342,000.




**Southern Nigeria.**—For the colony *see* **Lagos.** The protectorate, now under the same administration, has an area of 51,500 sq. m., and a population of 3,055,546 (1901).

**Physical Features.**—Coast low and intersected by the numerous mouths of the Niger and lagoons. The interior rises into hills and is mountainous in the east.

**Climate.**—Extremely unhealthy in the low swampy lands. Mean annual temperature about 84° F.; rainfall seldom less than 100 in. Cooler and drier on the upper Cross River.

**Resources and Production.**—The chief products are palm oil and rubber. Ebony, mahogany, and fibres are exported and cotton-growing is extending. Chief ports are Akassa, Brass, and Old Calabar.

**Trade.**—Exports (1905), £1,710,941; imports, £1,753,536.

**Spain.**—Area, 194,744 sq. m. Pop. (1904), 18,900,000.

**Physical Features.**—Surface of the interior an elevated tableland, surrounded and traversed by high mountain ranges; chief rivers, the Minho, Duero, Tagus, Guadiana, Guadalquivir, and Ebro.

**Climate.**—Central plateau very dry and hot in summer and cold in winter; maximum temperature at Madrid, 104° F.; minimum, 14° F.; winter rainfall, 20 to 10 in.; summer, 4 to 2 in.; mean temperature in the N., 59° F., with heavy rainfall; mean summer and winter temperature of Spain, 72° and 50° F.

**Resources and Production.**—About 80 per cent. of the total area is classed as productive, and of this 34 per cent. is under cereals and gardens, 3.7 vineyards, 1.6 olives, 20 grass, and 20.8 fruits. The principal crops in 1905 were: wheat, 49,541,794 cwts.; barley, 19,673,111 cwts.; maize, 15,935,412 cwts.; rye, 13,247,205 cwts. The vineyards yielded 389,483,116 gals. of grape juice, and the olives (1904), 38,549,720 gals. of oil. Other products are esparto, flax, hemp, and pulse; sericulture is also carried on. Live-stock: 498,157 horses, 2,075,142 cattle, 13,025,512 sheep, 2,385,664 goats. The value of crude minerals in 1905 was about £6,445,000. The chief outputs were coal and lignite, 3,335,600 tons; iron ore, 8,931,360; copper and cupreous pyrites, 2,579,520. 3,073,965 troy oz. of silver and 1,879,496 lbs. of quicksilver were obtained.

**Shipping and Railways.**—Principal ports are Barcelona, Bilbao, Cadiz, Santander, Alicante, Malaga, and Valencia. Merchant fleet (1904), 525 steamers, of 716,922 tons, and 418 sailing ships, of 63,637 tons. Vessels entered (1904), 19,316, of 15,242,021 tons; cleared, 18,153, of 15,678,067 tons. Railways open (1905), 9195 m.

**Exports** (special, 1904), £36,700,000. **Imports,** £36,847,000.

**Stavanger,** port of Norway; in lat. 58° 58′ N., and long. 5° 44′ E.; 413 m. from Hull, and 347 from Newcastle.

**Port Accommodation.**—Depth of water in harbour, 44 ft. and over. Quayage, 4800 ft., with depths alongside down to 24 ft. Two dry docks and slipways.

**Steam Communication.**—Wilson line from Hull; Bergenske and Nordenfjeldske Dampskibselskaber from Newcastle.

**Trade.**—Exports: fish, salt, copper, £329,500 (1904); imports: grain, meat, colonial produce, &c., £626,000. B. V.-C.

**Stettin,** port and coaling station in Germany on the Oder, about 36 m. from its mouth at Swinemünde; in lat. 53° 25′ N., and long. 14° 34′ E.; 860 m. from London.

**Port Accommodation.**—The harbour in the Oder has 26,000 ft. of quayage, with depths alongside 22 to 23 ft. In the basin are 8500 ft. of quayage, with a depth of 23 ft. Three floating dry docks, the largest being 510 ft. long. Improvements are projected, including four new docks.

**Steam Communication.**—Wilson line from Hull, and steamers from Stockholm, Riga, Copenhagen, &c.

**Trade.**—Exports: oil-seeds, potatoes, coal, zinc, &c.; imports: iron and hardware, grain, timber, fish, &c. B. C.

**Stockholm,** capital and port of Sweden, and a coaling station, at the outlet of the Mälar lake, 40 m. from the open sea; in lat. 59° 20′ N., and long. 18° 3′ E. From London, 1086 m.

**Port Accommodation.**—Depth at entrance to port, 25½ ft. Fully 31,000 ft. of quayage, with depths alongside down to 23 ft. Dry docks, the largest 340 ft. long, and slips.

**Steam Communication.**—Stockholm SS. Co. and Wilson line from London and Hull.

**Trade.**—Exports: iron and steel, wood, oats; imports: grain, provisions, coal, and wines. B. C.




**Straits Settlements.**—Area, 1600 sq. m. Pop. (1905), 603,460.

**Physical Features.**—W. and S. parts of Penang fairly level; a range of hills runs through its centre; coast of Malacca rocky and barren; interior mountainous, with intervening fertile valleys; Singapore traversed by hill range; surface low, undulating, and densely wooded.

**Climate.**—Almost uniform throughout the year. Maximum mean monthly temperature at 9 A.M. at Singapore, 84.4° F.; minimum, 79.1° F.; rainfall, 83 in.

**Resources and Production.**—The chief products are pepper, tapioca, rice, sugar, mace, sago, gutta-percha, indiarubber, dye-stuffs, rattans, tobacco, &c.

**Shipping and Railways.**—Principal ports, Penang and Singapore, *q.v.* Tonnage of vessels entered and cleared (1905), 17,325,394. Length of railways open (1905), 411 m.

**Exports** (1905), £28,296,069; to U.K., £5,721,487. **Imports** (1905), £33,223,382; from U.K., £3,401,181. The trade of Singapore is chiefly transit.

**Suez,** port and coaling station near the Red Sea terminus of the Suez canal; in lat. 29° 58′ N., and long. 32° 10′ E.; 3340 m. from London, and 2960 from Bombay.

**Port Accommodation.**—Depth at entrance, 24 ft., over a width of 160 ft. Quayage, 4878 ft. Dry dock, 406 ft. long.

**Trade.**—Exports: chiefly goods in transit, £538,400 (1904); imports: wheat, coffee, rice, wine, oil, &c., £923,200. B. V.-C.

The **Suez Canal** runs across the isthmus of Suez from Port Said on the Mediterranean, a distance of 87 m. Its width at water level is 100 to 120 yds. in the northern half and 80 to 100 in the southern; maximum draught, 27 ft. In 1905, 4116 vessels of an aggregate net tonnage of 13,134,105 passed through, of which 2484, with a tonnage of 8,356,040, were British.

**Sunderland,** port and coaling station at the mouth of the Wear, Durham; in lat. 54° 54′ N., and long. 1° 22′ E.; 310 m. from London.

**Port Accommodation.**—Several docks with depths on the sills down to 24½ ft. at high water ordinary neaps. Several dry docks up to 440 ft. long, and slipways.

**Trade.**—Exports: coal and coke, ships and boats, chemicals, £2,103,000 (1905); imports: timber, grain, petroleum, £734,000.

**Sundsvall,** port of Sweden in the Gulf of Bothnia; in lat. 62° 21′ N., and long. 17° 20′ E.; 1296 m. from London.

**Port Accommodation.**—Good anchorage, with depths of 23 to 35 ft. in the inner roads. Public quay, 3120 ft. long, with depths alongside of 9 to 21 ft., and several private quays. Two patent slips.

**Trade.**—Exports: timber, ores, tar, &c.; imports: colonial produce, corn, coal, &c. B. C.

**Surinam** (Paramaribo).—Paramaribo, the capital and chief port, is situated on the river Surinam, about 12 m. from its mouth; in lat. 5° 50′ N., and long. 55° 10′ E.

**Port Accommodation.**—Depth on inner bar, 20 ft., at high water ordinary springs. Quayage, 520 ft., with depths of 20 ft. at high water and 11 at low.

**Steam Communication.**—Demerara, Berbice, and "Direct" lines from London; D.W.I.M. from Amsterdam.

**Trade.**—Exports: cocoa, sugar, cocoa-nuts, balata; imports: machinery and hardware, provisions, &c. B. V.-C.

**Swansea,** port and coaling station in South Wales; in lat. 51° 34′ N., and long. 3° 57′ W.; 237 m. from Liverpool, and 62 from Bristol.

**Port Accommodation.**—Four large docks with depths down to 23½ ft. at high water lowest neaps, and a new dock under construction. Several dry docks, the largest being 453 ft. long.

**Trade.**—Exports: coal and coke, iron and copper and manufactured iron, chemicals, £6,077,000; imports: metals and ores, grain and timber, £3,332,000.

**Swatow,** port of China, at the mouth of the Han River; in lat. 23° 21′ N., and long. 116° 40′ E.

**Port Accommodation.**—Depth on bar at low water ordinary springs 16 ft. Quayage, 3000 ft. long, with depth of 7 ft. at high water. Private wharves, accommodating vessels 250 to 280 ft. long and drawing 19 to 21 ft. of water.

**Trade.**—Exports: sugar, tea, tobacco, and miscellaneous articles (1905), £2,080,912; imports: piece goods, opium, peas and beans, £2,201,405. B. C.

**Sweden.**—Area, 172,876 sq. m. Pop. (1905), 5,295,000.

**Physical Features.**—Surface mainly an inclined plain, sloping from the Kiölen mountains SE. to the Baltic, and drained by a series of rivers, mostly running parallel with one another; contains several large lakes.

**Climate.**—Wide range between summer and winter; mean annual temperature at Enontekis, 25.6°; at Umeå, 35.24°; Hernösand, 36.21°; Stockholm, 44.52°; Gothenburg, 46.34° F. Rainfall, 12.7 in. at Kalmar, 32.5 in. at Gothenburg.

**Resources and Production.**—Of the total area, 8.7 per cent. is under cultivation, 3.5 under meadows, and 50.9 under forests. Chief crops in 1905: oats, 59,466,825 bus.; rye, 24,424,125 bus.; barley, 13,141,975. A little flax, hemp, tobacco, and beet are grown. Number of live-stock (1904): 546,943 horses, 2,545,583 cattle, 1,105,903 sheep and lambs; 796,572 pigs. Mining forms one of the leading industries. Iron ore raised (1904), 4,019,000 tons; output of copper ore, 36,243 tons; zinc ore, 56,707 tons; coal, 315,825 tons. 387,600 tons of pig and other kinds of iron were exported in 1905, and wood is an important article, having been exported to the value of £7,664,500 in 1904.

**Shipping and Railways.**—Principal ports: Gefle, Gothenburg, Luleå, Malmö, Trelleborg, Stockholm, &c. Merchant fleet (1904), 1019 steamers, of 408,124 tons, and 1950 sailing vessels, of 265,748 tons. Vessels entered (1904), 34,606, of 9,110,000 tons; cleared, 35,480, of 9,230,000 tons. Length of railways open (1905), 7896 m.

**Exports** (special, 1904), £23,040,000. **Imports**, £31,778,000.

**Switzerland.**—Area, 15,469 sq. m. Pop. (1905), 3,459,000.

**Physical Features.**—Surface mountainous, being occupied by parts of the Alps and the Jura mountains; mainly an upland region, diversified by numerous valleys and lakes; drained by the Rhine, Rhone, and their affluents, by the Ticino, Maggia, Moesa, Inn, and other streams.

**Climate.**—Varies with altitude and position. Mean temperature in lower valleys about 50° F.; rainfall, 35 to 100 in.; mean temperature on the Great St. Bernard, 29.7° F. (Jan., 17.4°; July, 45.3°).

**Resources and Production.**—Dairy-farming is the chief agricultural occupation, the crops grown (rye, oats, and potatoes) being insufficient for home wants. There are large exports of cheese (1905, £1,836,000) and of condensed milk (£1,188,000). The number of cattle in 1901 was 1,340,375; of pigs, 555,261; and of goats, 354,634. About 21¾ million gallons of wine are produced. Manufactures are cotton and silk goods, jewellery, watches, chemicals, tobacco, chocolate, &c.

**Railways.**—Length of lines open (1904), 2603 m.

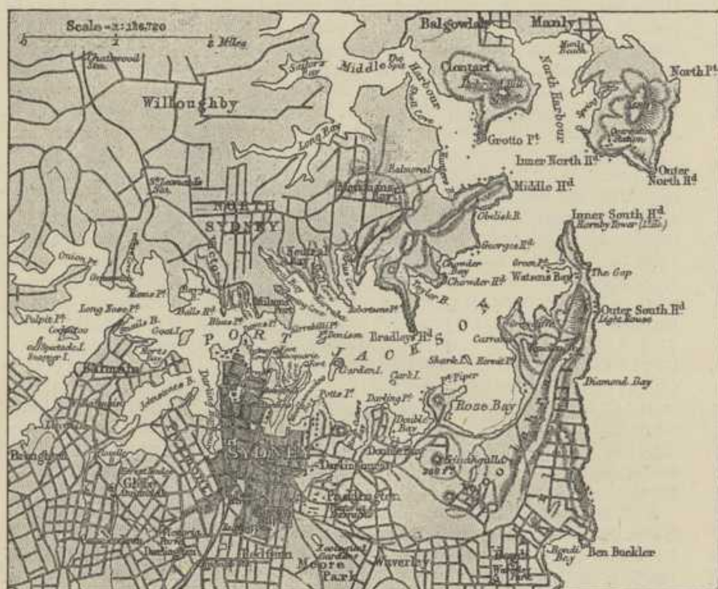
**Exports** (1905), £38,772,840; to U.K., £7,007,760. **Imports**, £55,194,040; from U.K., £2,752,120.

**Sydney,** capital of N. S. Wales, a port and coaling station on Port Jackson; in lat. 33° 51′ S., and long. 151° 11′ E.; 11,700 m. from London *viâ* Suez.

**Port Accommodation.**—Depth at entrance, 27 ft., at low water ordinary springs. Numerous wharves with depths down to 32 ft. at low tide, besides a number of private wharves. Several dry docks, the largest having a length of 640 ft., and floating docks.

**Steam Communication.**—Orient, Aberdeen, Shaw Savill, Albion, and Lund's lines from London; White Star from Liverpool; N.D.L. from Southampton; M.M. from Marseilles; Canadian-Australian from Vancouver; American and Australian line from San Francisco.

**Trade.**—Exports: wool, silver ore, gold, wheat, meat, &c.; imports: drapery, hardware and machinery, tobacco, &c. Value of trade, £41,607,000.




**Tamatave,** chief port of Madagascar, on the east coast; in lat. 18° 10′ S., and long. 49° 28′ E.; 470 m. from Mauritius.

**Port Accommodation.**—Open roadstead. Discharging by lighters.

**Steam Communication.**—Messageries Maritimes from Marseilles.

**Tampico,** port of Mexico, on the Panuco River, about 4 m. from its mouth; in lat. 22° 16′ N., and long. 97° 49′ N.; 5070 m. from London, and 710 from New Orleans.

**Port Accommodation.**—Depth on the bar, 22½ ft. Three wharves, with depths alongside down to 22½ ft.

**Steam Communication.**—Prince line from London; W.I. and P. and Harrison lines from Liverpool, and Ward line from New York.

**Trade.**—Exports: precious metals, coffee, goat-skins, fibre, £5,439,000 (1903–4); imports: hardware, textiles, machinery, &c., £2,532,000.

**Tangier,** port of Morocco; in lat. 35° 47′ N., and long. 5° 48′ W.; 1296 m. from London. Small pier.

**Steam Communication.**—Forwood line from London; Papayanni and Ellerman from Liverpool; C.T. from Cadiz.

**Trade.**—Exports: almonds, barley, eggs, cattle, goat-skins (1905), £295,763; imports: cotton goods, sugar, drapery, flour, £567,590. B. C.

**Tasmania.**—Area, 26,390 sq. m. Pop. (1901), 172,500.

**Physical Features.**—Surface undulating forest land, traversed by mountain ranges intersected by wide open plains; well watered by numerous rivers and lakes; many islands lie off the coast, which is indented by several deep bays and harbours.

**Climate.**—Everywhere salubrious. Mean annual temperature at Hobart, 55.1° F.; rainfall, 23.13 in.

**Resources and Production.**—The yield of the principal crops in 1905 was as follows: wheat, 776,478 bus.; barley, 93,664 bus.; oats, 1,200,024 bus.; potatoes, 64,606 tons. Hops and large quantities of fruit are grown. Number of live-stock (1905), 37,101 horses; 206,211 cattle; 1,583,561 sheep and lambs; 72,810 pigs. In 1905, 73,540 fine oz. of gold, 75,270 tons of silver-lead ore, 8610 tons of blister copper, 6300 tons of iron ore, and 51,993 tons of coal were obtained, besides tin, bismuth, &c.

**Shipping and Railways.**—Principal ports are Hobart, Launceston, Devenport, and Strahan. Registered shipping (1905), 62 steamers of 9238 tons, and 159 sailing vessels of 9102 tons. Railways open, 618 m.

**Exports**, excluding interstate trade (1905), £472,175. **Imports**, £738,117.

**Tientsin,** port of China, on the Pei-ho, about 50 m. from the mouth; in lat. 39° N., and long. 117° 45′ E.; 745 m. from Shanghai.

**Port Accommodation.**—Depth on bar at Taku, 8 or 9 to 16 ft. Vessels moor alongside the bund at Tientsin.

**Steam Communication.**—N.Y.K. from Kobe.

**Trade.**—Exports: wool, cotton, skins, camel's hair, £2,660,856 (1905); imports: rice, tissues, opium, metals, £12,870,000; from U.K., 9.2 per cent.

**Togoland.**—German colony on the Guinea coast. Area, 34,000 sq. m. Pop. 1,500,000.

**Physical Features.**—Coast low and sandy with lagoons behind, succeeded by undulating plain, covered with bush and palms; mountainous farther inland, with dense forests; watered by several rivers and streams.

**Climate.**—Unhealthy on coast, more salubrious on plateau; mean temperature, 78.8° F., with extremes of 95° and 68° F.; rainfall, 22.835 in.; at Bismarckburg on plateau, 59 in.

**Resources and Production.**—Maize, yams, tapioca, ginger, and bananas are cultivated by the natives, and plantations of rubber, coffee, cocoa, &c are being extended. A considerable trade is carried on in palm oil, kernels, &c. Railway, 104 m.

**Exports** (1905), £197,832. **Imports**, £388,016.

**Tonking.**—French colony in Indo-China. Area, 46,400 sq. m. Pop. 10,000,000.

**Physical Features.**—Surface formed of mountain, plain, and delta, watered by the Songka, Thai-bink, and their affluents, besides smaller rivers.

**Climate.**—Not unhealthy. Two seasons corresponding to the NE. (winter, October to March) and the SW. (summer, April to October) monsoons. Mean annual temperature at Hanoi, 75.56° F.; in the highlands temperature sometimes falls to 43°, but seldom below 50° F. in the delta.

**Resources and Production.**—The chief crops grown are rice, sugar-cane, cardamoms, cotton, coffee, tobacco, and fruit; there is also a considerable production of raw silk. The principal minerals worked are copper, iron, and coal. Principal port, Haiphong.

**Trade.**—*See* **Cochin-China.**

**Townsville,** port of Queensland, on Cleveland Bay; in lat. 19° 10′ S., and long. 146° 57′ E.; 11,570 m. from London, and 740 from Brisbane.

**Port Accommodation.**—Eastern pier wharf, 1900 ft. long, minimum depth, 15 ft., from the wharf is 26 ft. at low water. Swinging basin, 1300 ft. long, with a depth of 17 ft. below low water ordinary springs. Slipway, 280 ft. long.

**Steam Communication.**—B.I.S.N. from London; N.Y.K. from Yokohama; China Nav. Co., Adelaide line.

**Trade.**—Exports: sugar, meat, hides, wool, gold; imports: general merchandise.

**Transvaal.**—British colony in S. Africa. Area (including Swaziland), 117,732 sq. m. Pop. (1905), 1,399,528.

**Physical Features.**—Surface, elevated undulating plateau, traversed by mountain ranges and studded with isolated kopjes; the chief rivers are the Vaal, Limpopo, Komati, and Crocodile; many of the streams have but little water in winter.

**Climate.**—Generally healthy, except in the N. and in marshy districts. Temperature tropical in the N.; maximum and minimum, 95° and 37.4° F. Rainfall, chiefly in summer, 26 to 29 in.

**Resources and Production.**—Soil eminently suited for agriculture and stock-rearing, but at present the agricultural produce is insufficient for the wants of the people. Live-stock (1905), 150,000 horses, mules, and asses; 800,000 cattle; 1,200,000 sheep; 400,000 pigs. The country is rich in minerals; the gold extracted in 1906 was of the value of £24,580,000. Coal mining is also on the increase; output (1905), 2,327,499 tons, valued at £846,272. Other minerals are iron, tin, and copper.

**Railways.**—Length of lines open in Orange River and Transvaal (1905), 1685 m.

**Exports** (1905), £22,799,135. **Imports**, £16,845,893.

**Trebizond,** port of Asia Minor, on the Black Sea; in lat. 41° 1′ N., and long. 39° 46′ E.; 3625 m. from London.

**Port Accommodation.**—Safe anchorage in 25 ft., about 160 yards from the shore. Loading and unloading by lighters.

**Steam Communication.**—Rub. from Constantinople.

**Trade.**—Exports: nuts, tobacco, beans, skins, butter and eggs (1905), £581,770; imports: cotton manufactures, sugar, coffee, metals, &c., £1,207,230. Transit trade to Persia. Exports, £233,570; and imports, £612,180. B. C.

**Trieste,** chief port of Austria, and a coaling station on the Gulf of Trieste; in lat. 45° 39′ N., and long. 13° 45′ E.; 2990 m. from London, and 1300 from Port Said.

**Port Accommodation.**—Quays of the Porto Novo, 7600 ft. long, with depth, 28 ft. 8 in. Moles S. Carlo and Giuseppina 788 and 886 ft. long respectively, with a depth of 22 ft. alongside. Three dry docks, the largest 456 ft. long, and a floating dock.

**Steam Communication.**—Headquarters of the Austrian Lloyd; Anchor line from Glasgow and New York.

**Trade.**—Exports: textiles, raw cotton, coffee, sugar, tobacco, metals, &c. (1905), £18,283,000; imports: rice, raw cotton, tobacco, jute, oil-seeds, &c., £20,001,900. B. C.

**Trinidad and Tobago.**—Two British islands off the coast of S. America. Area, 2045 sq. m. Pop. (1905), 331,600.

**Physical Features.**—Interior mountainous, with valleys on either side of the central range; uplands covered with forests. Contains a large pitch lake, and active mud volcanoes.

**Climate.**—Mean annual temperature, about 80° F.; rainfall, 68 in.

**Resources and Production.**—Soil extremely fertile. Coffee exported in 1905–6, 2134 cwts.; cocoa, 502,528 cwts.; sugar, 724,813 cwts.; tobacco, 223,209 lbs. Asphalt exported (1905–6) from pitch lake, 103,708 tons.

**Shipping and Railways.**—Chief port, Port of Spain. Tonnage of vessels entered and cleared (1905), 1,963,121. Length of railway open, 81 m.

**Exports** (1905–6), £3,169,000; to U.K., £828,400. **Imports,** £3,304,000; from U.K., £957,600.

**Tripoli.**—Area, 398,900 sq. m. Pop. 1,000,000.

**Physical Features.**—Surface composed of a flat coastal belt, interior mountain ranges, plateaus, and desert, interspersed with oases.

**Climate.**—Dry and generally healthy; mean annual temperature on coast, 68° to 71.6° F.; rainfall very variable.

**Resources and Production.**—The crops grown are barley and wheat, the former being the chief food of the natives; dates, oranges, olives, lemons, and other fruits are largely cultivated; esparto grass grows wild, and is gathered for export, mainly to Great Britain. A large export trade is done in the products of the Sudan (ivory, ostrich feathers, goat-skins, &c.), brought from the interior by caravans.

**Shipping.**—Chief ports are Tripoli and Benghazi. The former, 2408 m. from London, and 198 from Malta, has a depth at the entrance of 23½ to 25½ ft. Vessels are discharged by lighters. B. V.-C.

**Trade.**—Exports (1904), £386,560; imports, £360,300.

**Tunis.**—Area, 64,630 sq. m. Pop. 1,820,000.

**Physical Features.**—Coast much broken; high promontories; surface hilly, with broad plains and large patches of rainless desert; coast lands low; in the S. and SE. several shotts or salt marshes.

**Climate.**—Hot summers and mild winters. Mean annual temperature, 64.05° F. (68.18° at Tunis; 70.25° at Kairwan; 59.59° at Ain Draham). Annual rainfall, 16.22 in.

**Resources and Production.**—Agriculture is the chief occupation, the products being wheat, barley, and oats. About 500,000 acres are under olives, and vines are also cultivated. The cork forests cover 490,625 acres; and in the S. there are about 1,350,000 date palms, the annual exports of dates being valued at about £32,000. Other products are esparto, henna, pistachio nuts, almonds, oranges, lemons, &c. Mining is actively carried on, the chief products being galena, lead, zinc, and phosphate, &c. Off the coasts there are valuable sponge, sardine, tunny, and other fisheries.

**Shipping and Railways.**—Principal ports, Bizerta, Sfax, Susa, and Tunis. The last, which is a coaling station, is 2130 m. from London and 470 from Marseilles. It is approached by a channel 6 m. long with a depth of 21 ft. Dry dock at Goulette at the sea end of the channel. The steamers of the Prince line from Manchester, Rub. from Genoa, &c., call. Length of railways open (1903), 430 m.

**Exports** (1905), £2,331,000; to U.K., £268,500. **Imports** (1905), £3,638,200; from U.K., £306,800. B. C.

**Turkey in Europe.**—Area, 65,350 sq. m. Pop. 6,130,200.

**Physical Features.**—Surface mountainous, with intersecting valleys; coast lands of Ægean and Adriatic low; several mountain lakes and coast lagoons; rivers generally short, the principal being the Maritsa (partly navigable), Struma, Vardar, and Drin. Much forest land on the plateaus.

**Climate.**—Varies in different districts; winters rigorous in the mountains; summer hot in the narrow valleys; temperature ranges between the extremes of 3° and 102° F.; mean at Constantinople of Jan., 42.8° F.; July, 72.5° F. Rainfall in Macedonia and Thrace, 28 in.

**Resources and Production.**—Agriculture is in a backward state. Wheat, barley, rye, oats, maize, cotton, tobacco, madder, sesamum, roses (for making attar of roses), vines, fruits of all kinds are grown. The forests yield pine, fir, larch, oak, cedar, and other timber trees. Bees, silk-worms, and leeches are reared with profit. Among minerals found are coal, copper, iron, lead-silver, sulphur, salt, and alum. There are valuable fisheries off the coast, those of the Bosphorus being worth some £250,000 annually.

**Shipping and Railways.**—Principal ports, Constantinople and Salonika. Merchant fleet (of whole Empire), 107 steamers, of 58,861 tons, and 916 sailing vessels, of 176,883 tons. Vessels entered and cleared (1903–4), 194,619, of 49,319,693 tons. Railways open (in Europe), 1269 m.

**Exports** (of Empire, 1900–1), £12,375,000. **Imports** (of Empire), £20,114,000. No more recent returns.

**Uganda.**—British Protectorate in Central Africa. Area, 223,500 sq. m. Pop. 4,000,000.

**Physical Features.**—Surface consists of forest-clad hills, with deep valleys between, many of them marshy; stretches out in the N. to wide plains, sloping to the Nile Valley; elevation, 5000 to 6000 ft. above sea-level; on the S. it touches Victoria Nyanza, Albert, and Albert Edward Nyanza.

**Climate.**—Generally healthy, owing to elevation; annual temperature fairly constant; diurnal range from 90° during day to 50° F. in the coolest night; rainfall, chiefly from March to May and Sept. to Nov., about 50 in.

**Resources and Production.**—Bananas, sesame, maize, durra, sugar-cane, and tobacco are cultivated, and cotton and coffee on a small scale; cattle are reared, but the principal articles of commerce are ivory, rubber, hides and skins.

**Shipping and Railways.**—On the lakes are 2 steamers, belonging to the Uganda Railway, a large armed steamer, 2 steam-launches, and several sailing vessels. Nile steamers run from Khartum to Gondokoro, on the N. frontier. Railway from Mombasa on the coast to Port Florence on Victoria Nyanza, 584 m.

**Exports** (1905), £108,395. **Imports,** £206,190.

**United Kingdom of Great Britain and Ireland.**—Area of England and Wales, 58,636 sq. m; pop. (1906), 34,547,016; of Scotland, 30,405 sq. m.; pop. 4,726,070; of Ireland, 32,360 sq. m.; pop. 4,386,035. Total area, 121,391 sq. m.; pop. 43,659,121.

**Physical Features.**—The central and south-eastern portions of England are undulating country; in the north and south-west and in Wales the elevations attain the height of mountains. Scotland consists in general of two elevated tracts, separated by the lowlands of the Clyde and Forth basins. Ireland is a shallow basin, with highlands round the coast. Scotland has a very irregular coast line, especially on the west, where islands also are numerous. On the west of England the Irish Sea and the Bristol Channel cut deep into the land, while on the east the large estuaries of the Humber and Thames form commodious harbours.

**Climate.**—The prevalent south-west winds and the warm waters of the Gulf Stream render the climate mild for the latitude. The average annual temperature ranges from 53° in the Scilly Isles to 45° in Shetland. Along a great part of the east coast the rainfall does not exceed 25 in., while in the west of the Scottish highlands it is over 80 in.

**Resources and Production.**—47,196,000 acres, or more than 60 per cent. of the total area, is cultivated land—that is, arable land and permanent pasture; woods and plantations occupy 3,070,000 acres, and of the remaining area part is utilised for grazing. In Scotland the cultivated land is smaller in proportion to area than in other parts of the kingdom. The arable land, about 19 million acres, tends, on the whole, to diminish and is considerably less than it was thirty years ago. The chief crops in 1905 were: wheat, 60,332,653 bus.; barley, 65,003,559 bus.; oats, 166,286,396 bus.; potatoes, 7,185,745 tons; and turnips, 26,563,060 tons. The numbers of live-stock in 1906 were: 2,110,024 horses, 11,691,955 cattle, 29,210,035 sheep, and 3,580,740 pigs. The value of the output of the mines and quarries in 1905 was £98,870,723. The chief products were: coal, 236,128,936 tons (£82,038,553); iron ore, 14,590,703 tons (£3,482,184); zinc ore, 23,909 tons (£139,806); copper ore, 6903 tons (£21,796); oil shale, 2,496,785 tons (£593,334); clay and shale, 15,134,754 tons (£1,763,008); sandstone, 5,640,684 tons (£1,634,357); limestone, 12,501,780 tons (£1,410,526); and salt, 1,889,910 tons (£556,437). 4,760,187 tons of iron were made from domestic ores, being nearly half the pig-iron manufactured in the country. Of other chief metals 19,838 tons of lead (£239,544) were extracted in 1904, 10,263 tons of spelter (£237,546), 4132 tons of tin (£237,546), and 141,592 oz. of silver (£15,560). The products of textile manufactures are of the annual value of about 170 millions sterling. The value of the fish, including shell-fish, landed on the coast in 1906 was £11,326,421.

**Shipping and Railways.**—The registered merchant vessels in 1905 were 10,059 sailing vessels, of 1,670,766 net tonnage, and 10,522 steamers, of 10,735,582 net tons. Sailing vessels, with an aggregate tonnage of 2,804,012, and steamers of 52,819,962 tons, entered British ports; sailing vessels of 2,852,751 tons and steamers of 56,416,760 tons cleared. The length of railways were: 15,731 in England and Wales, 3804 in Scotland, and 3312 in Ireland; total, 22,847.

**Trade.**—General exports (1906), £460,836,299; imports, £607,987,893.

**United States.**—A republic of North America. Area, including Alaska, 3,567,563 sq. m. Pop. (1905), 83,143,000.

**Physical Features.**—The Atlantic Plain, about 200 m. wide, reaches from the E. coast to the Appalachian highlands, westward of which the ground sinks again to the great central plain stretching across the continent to the Rocky Mountains, and watered by the Mississippi and its tributaries. Beyond the Rocky Mountains is a mountainous plateau, succeeded by the Cascade Range, the Sierra Nevada and Coast Range, from which the land drops down to the Pacific. In the N. are the great lakes. Many of the large rivers are navigable for long distances.

**Climate.**—This varies greatly with position. The winters of the E. and NE. are cold and severe, while on the Pacific slopes they are mild, and in the S. and SE. sub-tropical. Average temperature in January and July, and rainfall at New York, 30.3°; 73.6°; 48.8 in.; San Francisco, 50.4°; 58.5°; 22.8 in.; Chicago, 25.5°; 72.9°; 36.2 in.; New Orleans, 54.1°; 82.5°; 63.8 in.; Key West, 70.8°; 83.9°; 39.2 in.; Duluth, 11.9°; 66.7°; 32.5 in.; Denver, 27.8°; 73.2°; 14.9 in.; Yuma, 53.2°; 92°; 2.9 in. Extremes of temperature are not uncommon, the glass sometimes rising to 118° at Yuma, or sinking to 41° below zero at Duluth.

**Resources and Production.**—Agriculture is still the leading industry; there are about 425 million acres of cultivated land and 700 millions of pasture. The value of the farm products in 1905 was more than 1318 millions sterling. In 1906 the crop of maize was 2,837,975,000 bus.; of wheat, 712,797,000 bus.; of oats, 935,424,000 bus.; of barley, 173,450,000 bus. The potatoes harvested were 298,626,000 bus., the rice 17,299,000 bus., and the tobacco 682,429,000 lbs. The cotton crop in 1905 was 6994 million lbs., and the cane crop yielded (1903–4) 217,606 tons of sugar and 27,964,292 gals. of molasses, while the beet sugar produced (1904–5) was 189,726 tons. The domestic animals in 1906 were: horses, 18,718,578; cattle, 66,861,522; sheep, 50,631,619; swine, 52,102,847; besides mules, asses, and goats. The value of the dairy products in 1905 was about 136½ million sterling, and of the meat packing industries, 187¾ millions. In 1905 the wool clip was 299,309,853 lbs. The total area under forests in the U.S. may be set down at 780 sq. m., from which 19,717,253,000 ft. of timber were cut in 1905, and 3,192,123 cords of pulp wood. Among metallic products in 1906 were: pig-iron, 25,521,911 tons (£100,755,427); silver, 57,358,267 fine ozs.; gold, 4,702,235 fine ozs.; copper, 915,000,000 (£36,724,160); lead, 325,300 tons (£8,007,000); zinc, 201,245 tons (£5,471,875). The chief non-metallic minerals were: coal, 368,532,582 tons (£118,996,354); petroleum, 4,587,152,675 gals. (£19,850,652); limestone flux, 14,228,500 tons; phosphate rock, 2,102,067 tons. Value of products of U.S. manufactures in the census year (1900), £2,679,670,000; of cotton manufactures (1905), £92,574,500. The fisheries employ more than 7000 vessels, and the value of the products is estimated at £11,247,000.

**Shipping and Railways.**—The principal ports are Baltimore, Mobile, New Orleans, Newport News, New York, Philadelphia, Portland (M.), Portland (Oreg.), San Francisco, and others. The mercantile fleet in 1905, including canal boats and barges, comprised 24,681 vessels of 6,456,548 tons. Length of railways open in 1905, 218,011 m.

**Exports and Imports.**—General exports (1905–6), £358,357,000; imports, £252,079,000.

**Uruguay.**—A small South American republic. Area, 72,153. Pop. (1900), 936,120.

**Physical Features.**—The surface is undulating, with low hill ridges, which nowhere exceed 2000 ft.; the coast line is low, bare, and sandy. The chief river is the Uruguay, and its tributaries, the principal of which is the Rio Negro, in the very heart of the country.

**Climate.**—The coastal temperature ranges between 64.8° and 96.8° F.; the mean of Montevideo for 10 years is 62°, and the rainfall 43 in. in 36 days.

**Resources and Production.**—Uruguay is mainly a pastoral and agricultural country, and has a large export trade in cattle and meat. In 1901 there were in the country 6,326,601 head of cattle, 575,361 horses, 17,624,548 sheep, and 47,584 pigs. The crop of wheat in 1901–2 was 4,072,218 cwts., and of flax seed 172,330 cwts. The vine is also cultivated. Gold, silver, copper, coal, and other minerals are worked, but the industry is not important.

**Shipping and Railways.**—The principal ports are Colonia, Maldonado, Montevideo, and Sauce. Merchant fleet in 1905, 28 steamers of 13,220 tons, and 72 sailing ships of 31,062 tons net. Entered at Montevideo (1905), 4837 vessels of 6,805,617 tons; cleared, 4964 vessels of 6,700,071 tons. Railways open (1906), 1207 m.

**Exports** (1905), £6,940,230, of which £5,766,260 is the value of slaughter-house products and £440,080 of agricultural products. **Imports:** raw materials and machinery, clothing, comestibles, &c., £6,548,250.

**Valencia,** port of Spain, on the Guadalaviar River, 2½ m. from the sea; in lat. 39° 29′ N., and long. 0° 24′ W.; 1728 m. from London.

**Port Accommodation.**—Depth at entrance to port, 27 ft. Quayage, 6600 ft. Vessels sometimes discharged by lighters.

**Steam Communication.**—Spanish line from London; Adria line from Fiume.

**Trade.**—Exports: oranges, wine, onions, rice (1905), £2,069,700; imports: textiles, coal and petroleum, fish, £2,349,000. B. V.-C.

**Valparaiso,** chief port of Chile, and a coaling station; in lat. 33° 1′ 53″ S., and long. 71° 38′ W.; 8793 m. from London. Destroyed in 1906 by an earthquake.

**Port Accommodation.**—Open bay, sheltered except towards the N. Large vessels lie at anchor in 15 to 20 fathoms, and are discharged by lighters. Custom-house Mole with 800 ft. of quayage, and depths alongside of 30 to 33 ft. Two floating docks.

**Steam Communication.**—P.S.N. from Liverpool; Kosmos from London, Ca. Sud-Americana de Vapores.

**Trade.**—Exports: copper, hides, wheat, wool, &c.; imports: manufactured goods, iron, coal, petroleum. B. C.

**Vancouver,** port and coaling station of British Columbia, on Burrard Inlet; in lat. 49° 18′ N., and long. 123° 7′ W.; 14,363 m. from London by sea, and 2908 m. from Montreal by the C.P.R.

**Port Accommodation.**—7800 ft. of quayage, belonging to the C.P.R. and private owners, which can be reached at high water ordinary springs by vessels drawing 40 ft. Marine railway.

**Steam Communication.**—C.P.R. steamers from Hongkong; Can.-Austr. for Sydney; Pacific Coast for San Francisco.

**Trade.**—Exports: fish, lumber, gold, &c. (1905), £1,029,500; imports: general goods, £1,168,500.

**Venezuela.**—A republic on the north coast of South America. Area, 363,800 sq. m. Pop. (1904), 2,590,981.

**Physical Features.**—The country is traversed by three mountain ranges, outspurs of the Andes in the W. and N., and the Parima range in the SE. The ground round Lake Maracaibo in the NW. is low and swampy, and partly covered with forests. Between the Cordillera and the course of the Orinoco are the llanos, which occupy a large part of the total area. The Orinoco, with its tributaries, forms the principal waterway. The whole area may be divided into three zones, the agricultural, the pastoral, and that of forests and uncultivated lands.

**Climate.**—The mean annual temperature along the Orinoco (the warmest part) is 83° F.; below 2000 ft. the temperature varies from 73.4° to 84.2°; at Caracas the mean annual is 72°. There is a heavy rainfall on the slopes under the trade winds, and alternate wet and dry seasons on the llanos.

**Resources and Production.**—About a fifth of the population are engaged in agricultural pursuits. Coffee is the most important agricultural product, but the crop has fallen off and is now estimated at only 30,000 tons. Next in importance comes cocoa with an annual production of about 17,000 tons. Other crops grown are sugar, maize, cotton, and tobacco, &c. The forests yield valuable timber, indiarubber, cinchona, tonka beans, vanilla, sarsaparilla, divi-divi, copal gums, dyewoods, &c. Stock-raising is actively pursued in the llanos. Gold, copper, silver, and asphalt are the chief minerals worked. From the fishery round the island of Margarita, pearls to the value of £60,000 were sent abroad in 1905.

**Shipping and Railways.**—The principal ports of Venezuela are La Guaira, Maracaibo, Puerto Cabello, and Ciudad-Bolivar. The merchant fleet in 1905 consisted of 9 steamers, with an aggregate tonnage of 5264, and 15 sailing vessels. Railways working (1903), 523 m.

**Trade.**—Exports: coffee, cocoa, hides, asphalt, &c., about £1,600,000; imports (1904–5), £1,937,366.

**Venice,** port and coaling station of Italy, on the Adriatic; in lat. 45° 26′ N., and long. 12° 20′ E.; 2983 m. from London.

**Port Accommodation.**—Vessels drawing 24 ft. can enter at all times. Quayage, 3400 ft., with only 22 ft. of water alongside at low tide. 5900 ft. of quayage at Gindecca Island. Two dry docks and floating dock.

**Steam Communication.**—A.L. from Trieste; Rub. from Ancona.

**Trade.**—Exports: textiles, grain, hemp, glass and enamel ware, wood, &c. (1905), £13,215.920; imports: grain, cotton goods, fuel, oil, raw silk, &c., £15,268,771. B. C.

**Vera Cruz,** chief port of Mexico, and a coaling station on the Gulf of Mexico; in lat. 19° 11′ 30″ N., and long. 97° 8′ W.; 5054 m. from London.

**Port Accommodation.**—Depth available for vessels entering at low water ordinary springs, 32½ ft. Harbour of 900 acres. Quayage, 1⅞ m., besides government and railway piers.

**Steam Communication.**—Harrison and Leyland lines from Liverpool; C.G.T. from Havre; Ham.-Amer. from Hamburg, &c.

**Trade.**—Exports: ores, coffee, hides and skins, tobacco, &c. (1905), £3,715,993; imports: cotton goods, metals, raw materials, &c., £6,111,887. B. C.

**Victoria,** one of the Australian states. Area, 87,884 sq. m. Pop. (1905), 1,218,571.

**Physical Features.**—A large part of the surface is mountainous, the State being traversed from W. to E. by the Great Dividing Range, and its spurs; much pastoral and agricultural land; watered by the Murray, Goulburn, Yarra-Yarra, and other streams; several saline and fresh-water lakes.

**Climate.**—Moderately dry and healthy. Mean annual temperature, 57.4° F. (January mean, 66.1°; July mean, 49.7°); hot winds in January; mean annual rainfall, 25.61 in.

**Resources and Production.**—Of the total area 11½ per cent. is suitable for agriculture, 21¼ per cent. for pastoral purposes, and 13 per cent. under State forests, &c. The chief crops in 1905 were wheat, 23,417,670 bus.; barley, 1,062,139 bus.; oats, 7,232,425 bus.; potatoes, 115,352 tons. 1,726,444 gals. of wine were made. The domestic animals in 1905 were 385,513 horses, 1,737,690 cattle, 11,455,115 sheep, and 273,682 pigs. The quantity of gold raised in 1905 was 732,603 oz., valued at £3,173,744. Silver and tin were also mined, and 155,135 tons of coal were raised.

**Shipping and Railways.**—Principal port, Melbourne, *q.v.* Registered shipping (1905), 159 steamers of 80,650 tons, and 208 sailing vessels of 32,502 tons. Length of railways in operation (1905), 3394 m.

**Exports,** excluding interstate trade (1905), £14,492,123. **Imports,** £12,947,364. The following figures refer to the whole Australian Commonwealth, of which Melbourne is the temporary capital. Gold production (1905), 3,628,979 oz.; coal, 7,495,956 tons; wool exported, 437,195,847 lbs. Trade—Exports, £56,841,035; to U.K., £26,702,390. Imports, £38,346,731; from U.K., £23,074,717.

**Victoria,** port and coaling station in Vancouver Island; in lat. 48° 30′ N., and long. 125° 25′ W.; 14,283 m. from London by sea.

**Port Accommodation.**—Two piers, 1000 and 700 ft. long respectively, can be reached by the largest vessels. In the inner harbour are wharves of the Hudson Bay Co., the C.P.R., and private owners. Marine railways. Graving dock at Esquimalt.

**Steam Communication.**—C.P.R., Pacific Coast.

**Trade.**—Exports: lumber, fish, &c. (1904–5), £423,900; imports, £592,300.

**Vladivostok,** port in the Southern Ussuri District of Russian Asia; in lat. 43° 7′ N., and long. 131° 4′ E.; 11,261 m. from London, and 655 from Nagasaki. Terminus of the Siberian railway.

**Port Accommodation.**—The port can be entered at all times by vessels of any draught. Government wharf with 1500 ft. of quayage, and other wharves with not less than 27 ft. of water alongside. Dry and floating docks. Harbour kept open most of the winter by an ice-breaker.

**Steam Communication.**—Russian Volunteer Fleet from Odessa; N.Y.K. from Kobe.

**Trade.**—Exports: skins, furs, edible seaweed, &c.

**Wellington,** port and coaling station on Port Nicholson, in North Island, New Zealand; in lat. 41° 17′ 17″ S., and long. 174° 49′ 15″ E.; 11,957 m. from London *viâ* Cape Horn.

**Port Accommodation.**—About 10,600 ft. of quayage, with depths at low water varying from 16 to 32 ft. Patent slip.

**Steam Communication.**—N.Z.S. and Shaw from London.

**Trade.**—Exports (1904), £2,816,798; imports, £3,930,417.

**Western Australia.**—Area, 975,920 sq. m. Pop. (1905), 254,779.

**Physical Features.**—Surface mainly a plateau from 1000 to 2000 ft. high, with several mountain ranges near the W. and S. coast; a large part of the centre of the state consists of sandy desert; watered by many rivers, only in flood during rainy season; several lakes and salt marshes; coast deficient in harbours.

**Climate.**—Tropical in N. and NW., with rainy season from November to April; mean temperature at Derby in December, 88.4°; in July, 70.8°; rainfall, 34 in.; climate more moderate in the S. and SW., summer heat being tempered by sea breezes; summer heat in the E. trying, rising to 101.1° F. in Murchison goldfields; mean temperature at Perth, 65° F.

**Resources and Production.**—Gold mining, agriculture, and sheep-farming are the principal occupations. The output of gold in 1905 was 1,955,316 oz. Other minerals raised were silver, 359,744 oz.; copper ore, 2389 tons; tin ore, 1079 tons; coal, 127,364 tons. The crops raised were wheat, 2,293,333 bus.; barley, 49,497 bus.; oats, 283,987 bus.; potatoes, 6297 tons. 208,911 gals. of wine were produced. The live-stock included 97,397 horses, 631,825 cattle, 3,120,603 sheep, and 74,567 pigs. The forest area is 20,400,000 acres, and jarrah, karri, and other valuable woods are exported.

**Shipping and Railways.**—Principal ports, Albany and Fremantle. Registered shipping (1905), 43 steamers of 11,755 tons, and 332 sailing vessels of 8318 tons. Tonnage entered (1905), 675,456; cleared, 672,778. Railways opened, 700 m.

**Exports,** excluding interstate trade (1905), £9,059,162; to U.K., £4,210,201. **Imports,** £3,770,911; from U.K., £2,278,763.

**Windward Islands.** This West Indian group consists of St. Vincent, St. Lucia, Granada, and the Grenadines. Area, 506 sq. m.; pop. (1905), 173,089.

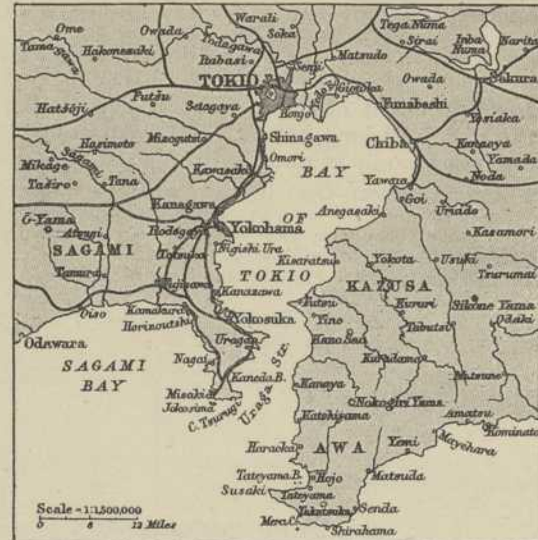
**Physical Features.**—Surface mountainous, rising to 3705 ft. in La Soufrière, St. Vincent; much of it is forest-clad.
**Climate.**—Healthy, with temperature ranging from 69° to 88° F.; and rainfall in different parts 60 to 155 in.
**Resources and Production.**—The chief products are sugar, rum, cocoa, cotton, arrowroot, and logwood.
**Shipping.**—Tonnage entered and cleared (1905), 2,939,168.
**Trade.**—Exports: (1905), St. Lucia, £109,028; St. Vincent, £53,078; Grenada, £283,956. Imports: St. Lucia, £285,987; St. Vincent, £69,097; Grenada, £237,256. Exports of the group to U.K., £264,024; imports from U.K., £220,640.

**Yokohama,** port and coaling station in Japan; in lat. 35° 26′ N., and long. 139° 40′ E.; 11,117 m. from London *viâ* Suez, and 18 m. by rail from Tokio.

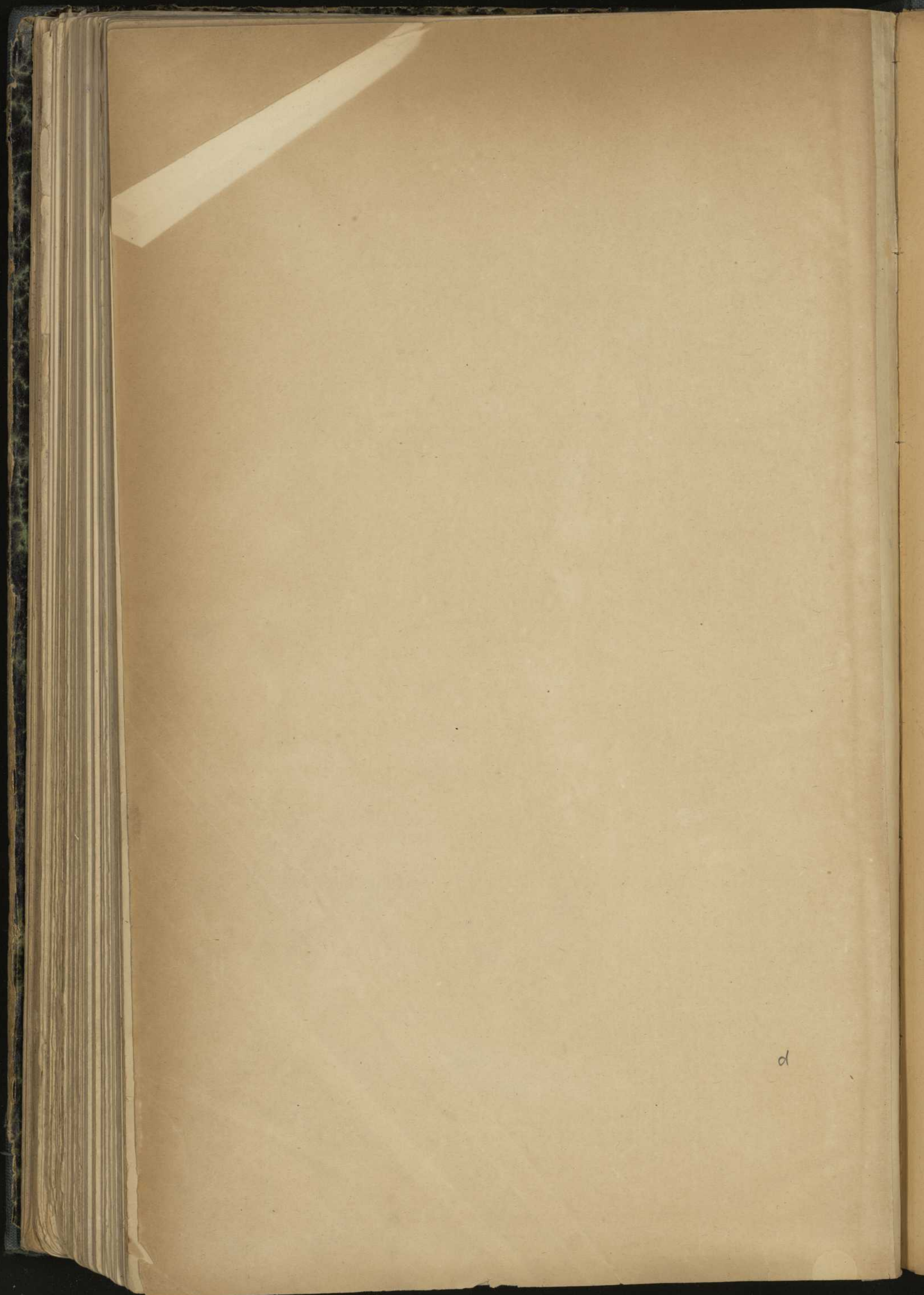
**Port Accommodation.**—Depth at entrance, 36½ ft. at ordinary high water. Anchorage down to 30 ft. Iron pier, 1900 ft. long, with 26 ft. of water alongside at low water. Five dry docks.
**Steam Communication.**—P. & O., N.Y.K., A.L., Ben line from London, &c.
**Trade.**—Exports: silk and silk goods, tea, metals, &c. (1905), £14,861,832; imports, £19,264,800.

**Zanzibar,** an island on the east coast of Africa under British protection. Area (with Pemba), 1020 sq. m. Pop. 200,000.

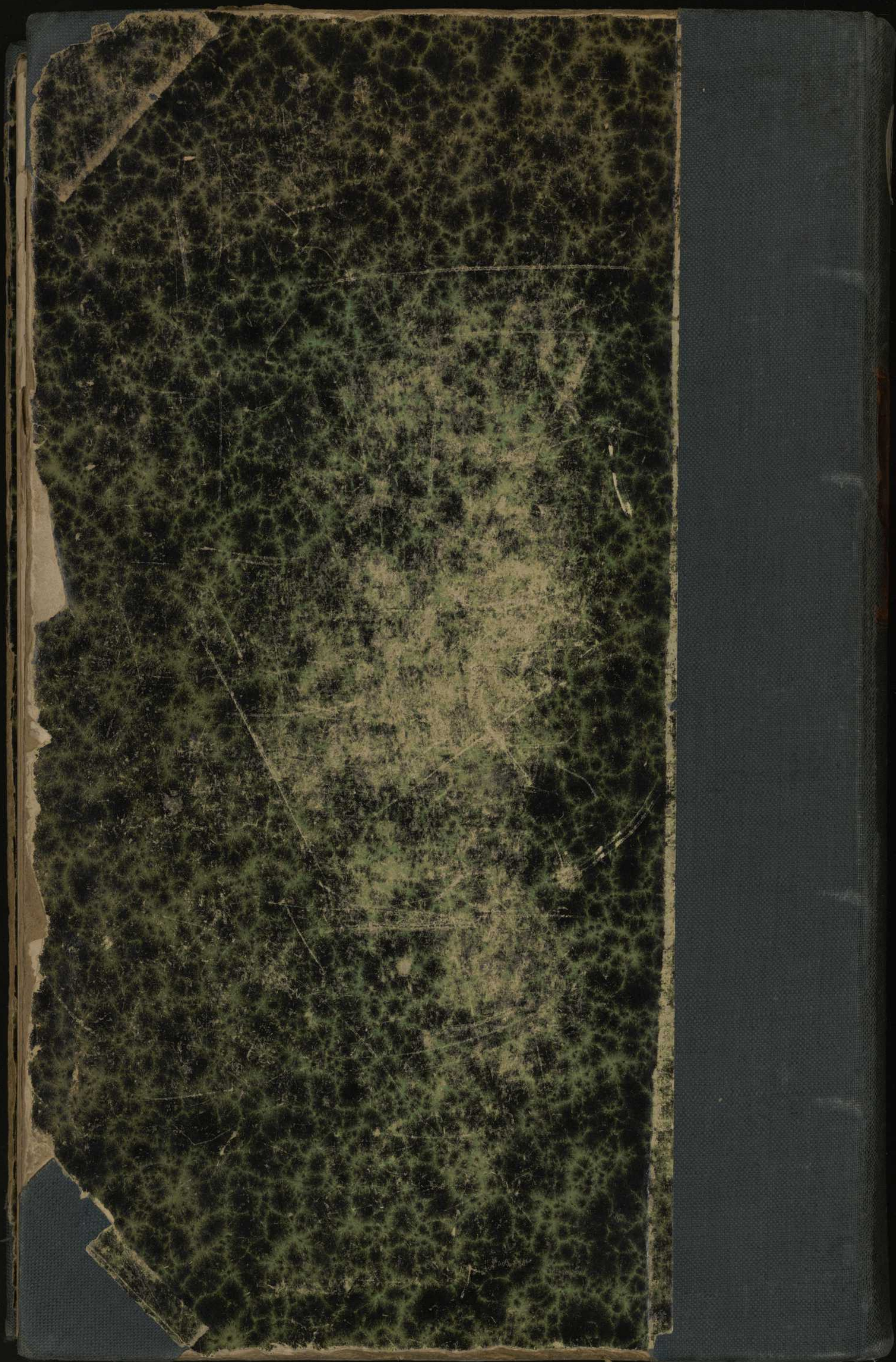
**Physical Features.**—Separated from the mainland by a deep channel; rests on a coralline formation, and rises in the interior to a low range of hills, on the slopes of which oranges, cloves, &c., grow; well-watered plains rich in verdure, where rice, manioc, sugar-cane, sorghum, &c., flourish.
**Climate.**—Not unhealthy. Mean temperature, 80.24° F.; great diurnal range; mean rainfall, about 61 in.
**Resources and Production.**—Cloves are the chief product of the island, but there is also a large transport trade in the products of the mainland, in ivory, copra, grain, rubber, hides, &c.
**Shipping.**—The port, Zanzibar, 6355 m. from London by the Suez Canal, affords good anchorage in 5 to 10 fathoms. A government pier can be




approached at high water by vessels drawing 10 ft. B.I.S.N. from London; A.L., D.O.A.L., MM. steamers call. 212 ocean-going vessels of 427,113 tons entered in 1905.
**Trade.**—Exports (1905), £1,120,650; to U.K., £97,424. **Imports,** £1,109,956; from U.K., £182,809.



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